

um-Tube Voltmeter R.F. Probe

the teacher in
school — and
the student

Small 1/2" x 1/2" x 1/2"

The purpose
designed to op
by the proper

for 160 or 60 m

The "Imp"—A 3-Tube

How's DX?

- *Beginner*

[Illegible text]

How Bad Are
There is no simple
whether your harassment
harms your performance.

The entire most and im-

1. Содержание

Hints and Kinks

Correspondence From Members

Hallicrafters brings you an entirely new class

The engineering team that developed the incomparable SX-101 and HT-32 now offers a precision rig that puts single sideband within reach of all



HT-37 Transmitter

The heart of the now-famous HT-32—the needed, basic performance characteristics—is yours in this precision-engineered new AM/CW/SSB transmitter—and at a price we did not believe possible when we began designing it! Same power. Same rugged VFO construction, and identical VOX. You'll be amazed at the smooth, distinctive speech quality that's yours for the first time at moderate cost.

FEATURES: 144 watts plate input (P.E.P. two-tone); five band output (80, 40, 20, 15, 10 meters); all modes of transmission—CW, AM, S.S.B.; unwanted sideband down 40 db. at 1KC; distortion products down 30 db. or more; carrier suppression down 50 db.; modern styling; instant CW Cal. from any mode; both sidebands transmitted on AM; precision V.F.O.; rugged heavy duty deluxe chassis; 52 ohm pi network output for harmonic suppression; dual range meter for accurate tuning and carrier level adjustment; ideal CW keying; full voice control system built in.

FRONT PANEL CONTROLS, FUNCTIONS, CON-

NECTIONS: Operation—(power off, standby, mox, cal, vox); Audio gain; R.F. level; Final tuning; Function—(upper sideband, lower sideband, DSB, CW); carrier balance; Calibration level; Driver tuning; Band selector V.F.O.; Microphone connector; Key jack.

TUBES AND FUNCTIONS: (2)-6146 Power output amplifiers; 6CB6 Variable frequency oscillator; 12BY7 R.F. driver; 6AH6 1st Mixer; 6AH6 2nd Mixer; 6AB4 Crystal oscillator; 12AX7 Voice control; 12AT7 Voice control; 6AL5 Voice control; 12AX7 Audio Amplifier; 12AT7 Audio amp and carrier Oscillator; 12AT7 Audio Modulator; (2)-12AT7 Balanced Modulators; 5R4GY HV Rectifier; 5V4G LV Rectifier; OA2 Voltage Regulator.

REAR CHASSIS: Co-ax antenna connector; Line fuse; Control connector; AC power line cord.

PHYSICAL DATA: Matching unit for SX-111; cabinet is gray steel with brushed chrome trim and knobs. Size: 9" high x 19 1/4" wide x 15 1/2" deep. Shipping weight: approximately 80 lbs.

The new ideas in communications are born at . . .

Export Sales: International Division,
Raytheon Mfg. Co., Waltham, Mass.
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h hallicrafters
Chicago 24, Ill.

of SSB equipment

SX-111 Receiver

Here's the receiver you've been waiting for—a real thoroughbred that retains the *essential performance characteristics* of the renowned SX-101, but at a price that can put it in your shack tomorrow! Rugged . . . dependable . . . beautifully styled, the new SX-111 is outstanding evidence that Hallicrafters aim is always to bring you the finest equipment at the lowest possible price.

FREQUENCY COVERAGE: Complete coverage of 80, 40, 20, 15 and 10 meters in five separate bands. Sixth band is tunable to 10 Mc. for crystal calibrator calibration with WWV.

FEATURES: AM/CW/SSB reception. Dual conversion, Hallicrafters' exclusive selectable side-band operation. Crystal-controlled 2nd converter. Tee-notch filter. Calibrated S-meter. Vernier dial-pointer adjustment. Series noise limiter. Built-in crystal calibrator. Exceptional electrical and mechanical stability. Large slide-rule dial. **SENSITIVITY:** One microvolt on all bands, with 5 steps of selectivity from 500 to 5,000 c.p.s.

TUNING MECHANISM: New friction-and-gear type with 48:1 tuning ratio. Virtually eliminates backlash.

CONTROLS: Tuning; Pointer Reset; Antenna Trimmer; T-notch Frequency; RF Gain; Audio Gain; Band Selector; Function (off/on, standby, upper or lower sideband, calibrate); AVC off/on; BFO off/on; ANL off/on; Selectivity.

TUBES: 10 tubes plus voltage regulator and rectifier. 6DC6 RF Amplifier; 6BY6 1st converter; 6C4 Oscillator; 6BA6 2nd converter; 12AT7 Dual crystal second converters; 6CB6 1650 kc. i.f. amplifier; 6DC6 i.f. amplifier (50 kc.); 6BJ7 AVC-noise limiter-detector; 12AX7 1st audio and BFO; 6AQ5 Power output; 5Y3 rectifier; AO2 Voltage regulator.

POWER SUPPLY: 105-125 volts, 50-60 cycle AC.

PHYSICAL DATA: Size: 18¾" wide x 10¼" deep x 8¾" high. Attractive gray steel cabinet with brushed chrome trim. Shipping wt. approximately 40 lbs.



The last word in features and design!

SX-110 Receiver

Never before have so many outstanding, wanted features been incorporated in an all-purpose receiver—features developed originally for the highest-priced sets.

FREQUENCY COVERAGE: Broadcast Band 540-1680 kc plus three short wave bands covers 1680 kc—34 mc.

FEATURES: Slide rule bandspread dial calibrated for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens' band. Separate bandspread tuning condenser, crystal filter, antenna trimmer, "S" Meter, one r-f, two i-f stages.

INTERMEDIATE FREQUENCY: 455 kc.

TUNING ASSEMBLY AND DIAL DRIVE MECHANISM: Ganged, 3 section tuning capacitor assembly with electrical bandspread. Circular main tuning dial is calibrated in megacycles and has 0-100 logging scale.

AUDIO OUTPUT IMPEDANCE: 3.2 and 500 ohms.

TUBE COMPLEMENT: Seven tubes plus one rectifier: 6SG7, r-f amplifier—6SA7, converter—6SG7, 1st i-f amplifier—6SK7, 2nd i-f amplifier—6SC7, BFO and audio amplifier—6K6GT, Audio output—6H6, ANL-AVC-detector—6Y3GT, rectifier.

AUDIO POWER OUTPUT: 2 watts.

POWER SUPPLY: 105/125 V., 50/60 cycle AC.

PHYSICAL DATA: Gray steel cabinet with brushed chrome trim. Size 18¾" wide x 8" high x 10¼" deep. Shipping weight approximately 32 lbs.

S-108 Receiver

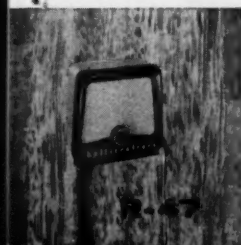
Same basic performance as SX-110 (above) less S-Meter, antenna trimmer and crystal filter, but includes a built-in speaker.

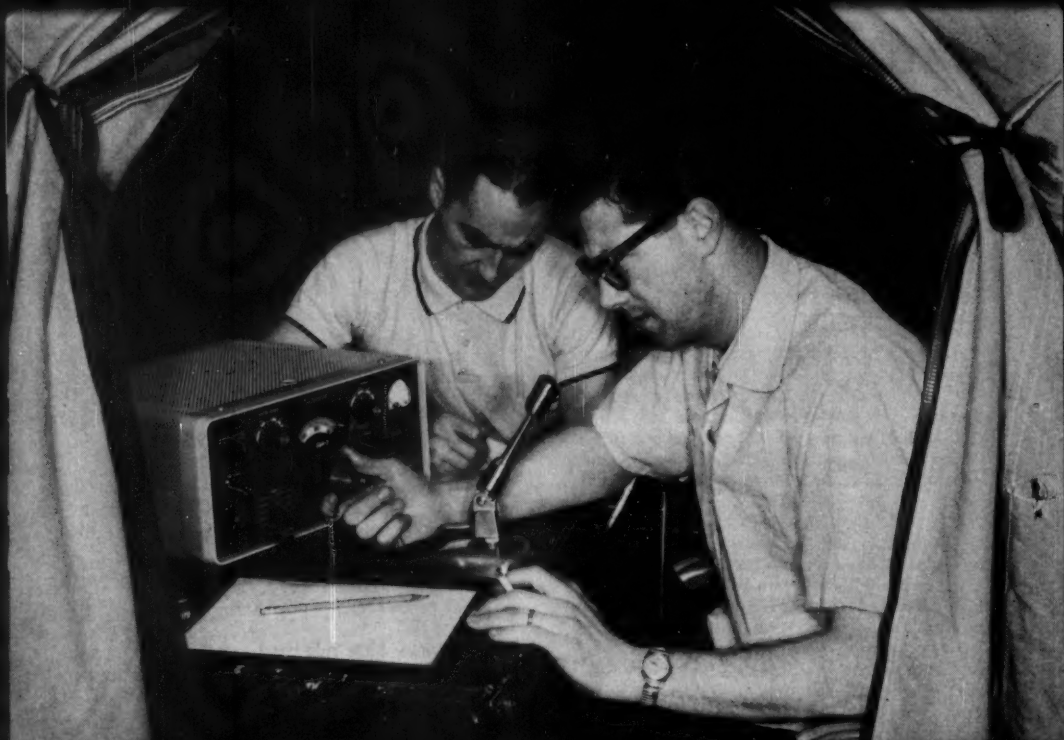
Two outstanding speaker values

R-47 SPEAKER

Specially designed for voice and SSB. Flat response from 300 to 2850 c.p.s. Input impedance: 3.2 ohms. Size: 5½" x 5¼" x 3½". Wt. 2½ lb.

R-48 SPEAKER (See photo with HT-37 and SX-111). Latest design, elliptical assembly. 3.16 oz. Alnico V magnet. Fidelity switch for music or voice. 3.2 ohm input impedance. 6½" x 13¼" x 8¼".





POINT-PACKED FIELD DAY PERFORMANCE

with Collins KWM-2 Mobile SSB Transceiver

Here's the teammate that can put you among the high scorers in Field Day competition . . . Collins KWM-2 SSB Transceiver. It sets up in minutes and delivers top fixed station performance under the most severe Field Day emergency conditions.

The KWM-2, the only SSB mobile transceiver on the market, quickly slips from its mobile mount to a fixed station installation. It instantly connects to a power supply, antenna and antenna selector. One compact unit transmits and receives, yet weighs only 18 lbs.

The 100 watts P.E.P. SSB output gives you a strong, clean signal from 3.4 to 30.0 mc. Mechanical Filter Sideband generation, Automatic Load Control, RF inverse feedback and exceptional frequency stability assure extra fast contacts, even on crowded bands. That means you get more QSO's in less time for more total points.

Get a first hand demonstration at your nearby Collins Distributor. He'll show you how easy it is to be a top Field Day scorer with the Collins KWM-2.



COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA

QST

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by leading equipment designers

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Heath's choice of Eimac 4-400A radial-beam tetrodes was a natural one. These time-proved tubes complement the amplifier's simple, clean, straightforward design. And their low

grid-plate capacitance and low driving-power requirement aid in considerable simplification of the associated circuit and driver stage — to make do-it-yourself construction even easier.

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Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting; ± 500 cycles.....**\$2.95 Net**

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Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24000 to 24666, and 25000 to 27000 Kc., ± 3 Kc.; .050" pins.....**\$4.95 Net**

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Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 Mc., ± 15 Kc.; .050" pins.
\$6.95 Net

CITIZENS BAND CLASS "D"

Type Z-9R, Transmitter

FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225; calibrated to .005%. (Be sure to specify manufacturer of equipment).....**\$2.95 Net**

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Type Z-9R, Receiver

Specify I.F. frequency, also whether I.F. is above or below transmitter frequency. Calibrated to .005%. (Be sure to specify manufacturer of equipment).....**\$2.95 Net**

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Official assigned frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc.....**\$3.45 Net**

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To determine band edge. To keep the VFO and receiver properly calibrated. 100 Kc. ..**\$6.95 Net**

Z-6A



Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

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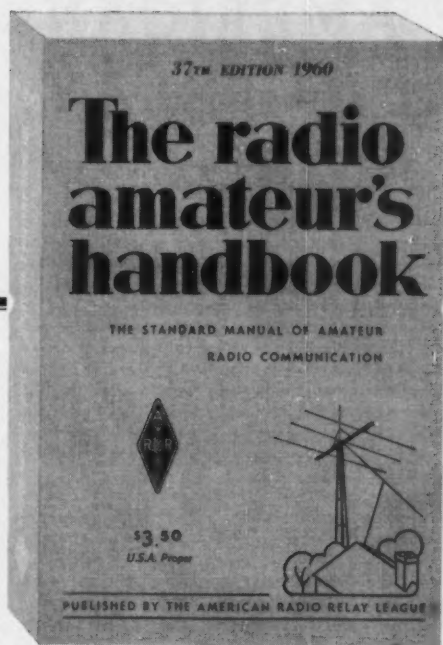
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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. ARRL Field Organization station appointments are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

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Vice-Director: Lloyd H. Manamon W2VQR
709 Seventh Ave., Asbury Park, N. J.

Midwest Division

ROBERT W. DENNISTON W0NWX
Box 631, Newton, Iowa
Vice-Director: Sumner H. Foster W0GQ
2315 Linden Dr., S.E., Cedar Rapids, Iowa

New England Division

MILTON E. CHAFFEE W1EFW
53 Homestead Ave., Southington, Conn.
Vice-Director: Carmine A. Polin W1SJO
17 Park St., West Haven 16, Conn.

Northwestern Division

R. REX ROBERTS W7CPY
837 Park Hill Drive, Billings, Mont.
Vice-Director: Harold W. Johnston W7PN
2727 Belvidere Ave., Seattle 6, Wash.

Pacific Division

HARRY M. ENGWECHT W6HC
770 Chapman, San Jose 26, Calif.
Vice-Director: Ronald G. Martin W6ZF
1011 Terrace Drive, Napa, Calif.

Roanoke Division

P. LANIER ANDERSON, JR. W4MWH
428 Maple Lane, Danville, Va.
Vice-Director: Joseph F. Abernethy W4AKC
768 Colonial Drive, Rock Hill, S. C.

Rocky Mountain Division

CLAUDE M. MAER, JR. W0IC
485 Race St., Denver 6, Colo.
Vice-Director: John H. Sampson, Jr. W7OCX
3618 Mount Ogden Drive, Ogden, Utah

Southeastern Division

JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta 17, Ga.
Vice-Director: Thomas M. Moss W4HYW
P.O. Box 644, Municipal Airport Branch,
Atlanta 20, Ga.

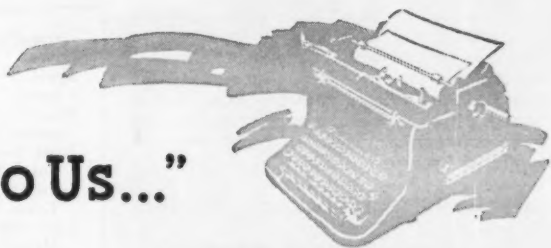
Southwestern Division

RAYMOND E. MEYERS W6MLZ
177 Anderson Way, San Gabriel, Calif.
Vice-Director: Virgil Talbott W6GTE
1175 Longhill Way, Monterey Park, Calif.

West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas
Vice-Director: Robert D. Reed W6KY
4339 S. Floria, Tulsa 5, Okla.

"It Seems to Us..."



QRP, OM!

Amateurs in the United States are very fortunate in being allowed to run a kilowatt input to their transmitters — and we don't even need accurate measurement of our power till we pass the 900-watt mark. Canadians, too, have relatively liberal power regs, being permitted 500 watts *output* (figuring a transmitter efficiency of 70%, this allows an input of some 700 watts), comparing quite favorably with the 100 to 150 watts input most countries permit. When one is trying to work some rare DX already being called by three layers of QRM, or when one has a full hook for a TCC sked, or is trying to knock off the fiftieth state on 6 meters, the extra juice really helps.

But it does seem downright ridiculous to use a full gallon in a state-wide traffic net, or to rag-chew with a buddy ten miles away. It seems especially silly to hear a couple of hams crying on each other's shoulder about all the problems they have with adjacent-channel or fundamental-overload TVI — all the while running 50-Mc. rigs at maximum legal power, when over the distances being covered, one watt would produce an S9 signal!

For most c.w. and sideband rigs, power reduction poses little problem. Either the exciter can be run "barefoot" into the antenna, or the final itself adjusted for lower input. For big a.m. transmitters, it may be necessary to have a separate low-power rig sitting next to the "gallon," but in only a few cases would this be a hardship.

What are the advantages? Less TVI, a lower electricity bill, and — most important — less QRM for all of us. We don't have formulas at hand to prove it, but we're willing to bet that a graph plotting interference complaints against the power of the transmitter being picked up, especially on v.h.f., would go something like this: 10 watts, no neighbors troubled; 100 watts, 2 neighbors; 1,000 watts, 16 neighbors! It is perfectly true that if a transmitter does not interfere with TV, BC and hi-fi sets of good design, its operator has no obligation to do anything about interference with sloppy sets, and if a ham needs to run high power to a clean transmitter to accomplish his objective, we would be the last to tell him to refrain. But when low power will do for the job at hand, doesn't it make sense to avoid unnecessary chopping-up of a neighbor's TV program, no matter how punk his receiver?

It also stands to reason that the bands can handle only so much useful r.f. at a time. Low-power stations can be received closer to each other without harmful mutual interference than can high-power stations. If amateurs all ran only enough power to do the job, would we not find the bands "wider"?

And now, the final argument — there is a little-known section in the Communications Act of 1934 which reads:

Section 324. In all circumstances, except in case of radio communications or signals relating to vessels in distress, all radio stations, including those owned and operated by the United States, shall use the minimum amount of power necessary to carry out the communication desired.

... QRP, OM!

DIRECTORS' MEETING

Each May we customarily use a little space on this page to remind ARRL members that their Board of Directors will soon be meeting in Hartford, and thus if you have anything on your mind regarding our hobby or our League, now is the time to write *your* director. Consider yourselves so reminded for the 1960 annual meeting which occurs on May 13.

This year we'll leave it at that, and use the rest of the space available for a look "behind the scenes." Minutes of meetings are, by their very nature, restricted to basic facts. While the minutes accurately reflect (they had darn well better be accurate!) motions offered and either adopted or rejected, far more is accomplished by the annual affair than can be shown in such a document.

To begin with, directors have a chance to get better acquainted with each other, the officers, and the staff members. They look over the Headquarters, visit WIAW, inspect financial records, and ask questions and offer suggestions on any phase of League activities — the content of *QST*, the prices of publications, contest and awards administration, public relations, advertising policies, personnel relations, working-space problems and so on.

In conversations with one another, the directors are likely to discuss such things as ways of increasing membership in their divisions, making the work of volunteer officials easier yet more effective, stimulating interest in local radio clubs, improving participation in the Amateur Radio Emergency Corps and

(Please turn the page)

RACES, and the like. These discussions are mutually helpful, and occasionally spark an idea for an action next day at the formal meeting. On the other hand, sometimes a director will discover that a pet proposal he has brought from his division gets no support from amateur sentiment in other areas as expressed by his fellow directors, so he drops the idea, knowing that any proposal must have majority support on a nationwide basis for passage.

Yes, behind the eight, ten or twelve hours of formal meeting which will be reported line by line in *QST*, there are many more hours in which your director represents you at Hartford in the management of your organization, in addition to the time he spends on League matters during the rest of the year. It makes good sense to let him know your views!

QST

Hamfest Calendar

Connecticut — The New London hamfest, sponsored by the Tri-City Amateur Radio Council, will be held May 14 at Ocean Beach Park in New London. Activities beginning at 9 A.M. include a YL meeting, FCC exams, a mobile contest, Connecticut phone net meeting and technical talks. Two other speakers are scheduled — one representing the North Pole and the other the South Pole. Tickets are by advance registration only and the closing date is May 7, if you wish to attend the evening banquet. The registration fee includes a roast beef dinner at 7 P.M. YLs may be registered for \$4, including the dinner. Registrations only (no dinner) may be purchased at the door for \$1.50. For advance registrations, contact Richard Darling, K1HYQ, 46 Mahan St., New London.

Illinois — The annual Mississippi Valley hamfest will be held at Moline in the Gra Ell picnic grounds, three miles east of the Quad City Airport on Route 6, on May 22. Noon lunch will be available for those who wish a warm meal and refreshments are available all day. There will be parking space and a nice shaded lawn for family picnics. Activities start at 9 A.M. Central Daylight Time. Advance registration is \$1.50 and may be obtained from R. E. Gardner, K9IYN, 1015 38th Street, Moline. Tickets at the gate will be \$2.

Illinois — The Starved Rock Radio Club hamfest will be held on June 5 at the LaSalle County 4-H Home and Picnic area southwest of Ottawa (same place as last year). Follow Route 23 to the south end of the Illinois River bridge at Ottawa, turn west on Route 71, following big yellow hamfest signs. There is plenty of space and adequate facilities for all. Free swap section. Advance registration is \$1.00, and must be received by May 25. Registration at the gate is \$1.50. The hamfest site is a short drive from the Starved Rock State Park and recreation area. Food is available on the grounds. Free coffee and doughnuts 1000 to 1030 CDST. For further information, contact George E. Keith, W9QLZ, RFD 1, Box 171, Ozark.

Indiana — The Columbus ARC will hold a combination Hamfest — Swapfest at Donner Park shelter house in Columbus on Sunday, May 22, from 1000 through 1500 CDST. Registration fee is \$1.00. Adequate picnic facilities and refreshments are available at the park. For further information, contact Frank Reiser, W9AH, R.R. 2, Columbus, Indiana.

Kansas — The Hi-Plains Amateur Radio Club will hold its 11th hamfest May 15 at Plains. Entertainment is planned for XYLs and a basket dinner will be served at noon.

Kansas — The 13th annual CKRC hamfest in Kenwood Park at Salina, will open at 9 A.M. on June 5. Bring a covered dish and silver service for your own family. Soft drinks and coffee will be furnished by the CKRC. Everyone is welcome, but only licensed hams and their YLs or XYLs are

COMING A.R.R.L. CONVENTIONS

- April 30-May 1 — Oregon State, Portland.
- May 1 — New England Division, Swampscott, Massachusetts.
- June 4-5 — Southeastern Division, Atlanta, Georgia.
- June 18-19 — West Gulf Division, Dallas, Texas.
- July 30-31 — North Dakota State, Minot.
- September 10-11 — Central Division, Indianapolis, Indiana.
- September 16-17 — Quebec Province, Montreal.
- October 7-8 — Great Lakes Division, Cleveland, Ohio.

eligible for registration. Registration fee is \$1. For information, contact Bud Baer, W4JAS, 857 Shawnee Ave., Salina.

Kansas — The Kaw Valley Radio Club of Topeka, will hold its annual Hamarama on May 22 at Lake Shawnee. There will be mobile and fixed stations on standby frequencies of 3920 kc. and 29.6 Mc. to guide out-of-towners. Starting time is 9 A.M. There will be mobile hunts on 75 and 10 with prizes for the winners. Bring auction sale material for a real ham auctioneer "that is the best a ham can do with another's gear." Bring a covered dish for the noonday meal. The club will serve coffee and soft drinks. There will be plenty of boat space for those who have boats and want to try the lake.

Massachusetts — The Massachusetts Phone Net will hold its annual spring meeting May 14 at Grandview Hall, 21 Grandview Ave., in Worcester, at 1 P.M. There will be discussions on traffic handling and net operations, eyeball QSOs and refreshments. The meeting will adjourn to a local restaurant for dinner a la carte. Registration fee at the door will be 50 cents; dinner will be on an individual basis. Those planning to come are asked to contact WIDX by May 12 on the Massachusetts Phone Net or at 26 Richards St., Worcester.

Mississippi — The Biloxi Amateur Radio Club will hold its third annual hamfest June 4-5 at the Community House in Biloxi. The program includes an open house and games with a Dutch treat supper on Saturday and a hidden transmitter hunt and other events on Sunday. Main attraction will be the free shrimp boil Sunday noon. Tickets are \$1. For information, write BARC, Box 1574, Biloxi.

New York — Rochester will play host to the Western New York hamfest May 14 at the Doud Legion Post on Buffalo Road. There will be special sessions on v.h.f., DX and transmitter design plus contests in code transmitting and QSLs. Open house at the AWA's historical barn museum and an Old Timers' luncheon is scheduled at noon. Exhibits and registration start at 1 P.M. The banquet is at 6:30 P.M. Registration will be \$2.25 and dinner will be \$2.75. Advance combination registration and dinner will be \$4.50. Mail checks to Larry McConnell, K2UC1, 256 Pemberton Road, Rochester 22.

New York — The Rome Radio Club will hold its annual hamfest on June 5 at Beck's Grove. There will be guest speakers, entertainment and food for all. Tickets are \$4 for adults and \$1.25 for children. For further information or tickets, write G. K. Bennison, W2IXR, P. O. Box 184, Holland Patent, N. Y.

Ohio — The sixth annual Toledo Sideband Dinner is set for May 28 at Brail Hall on Alexis Road in Toledo. This affair is an informal reunion of sidebanders from a wide area. The hall will be open all day Saturday with dinner at 7 P.M. Tickets are \$4.50 each, with a choice of roast beef or chicken dinner. Reservations must be in and paid by May 15. Motel reservations can be made and confirmed in advance through K8AEC or W8ALP. Reservations are available from K8AEC, Ron Reed, Route 3, Tiffin or on the Interstate Sideband Net, 3985 kc. every evening at 2000 EST.

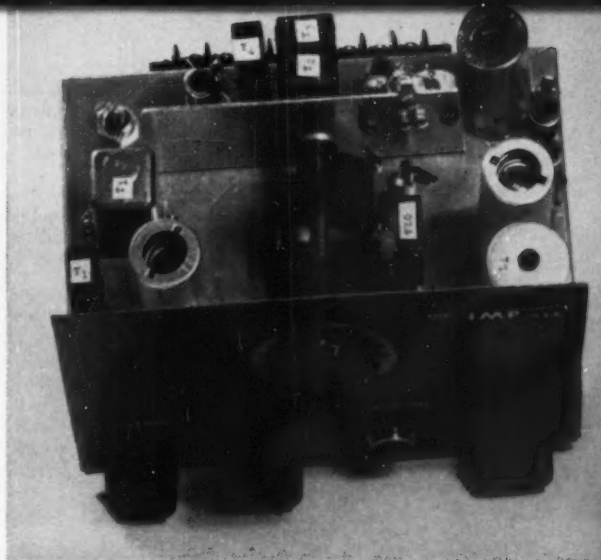
Ohio — The 1960 Dayton Hamvention will be held on

(Continued on page 44)

The "Imp" uses a simple crystal filter and VXO frequency control to put a single-sideband signal on the 14-Mc. band. The 5 X 7-inch chassis shown in this photograph contains the entire r.f. and audio circuits of the exciter. Output from the 6CL6 amplifier is about 1 watt.

A Single-Sideband Exciter of Simple Design

BY JOSEPH S. GALESKI, JR.,
W4IMP



The "Imp"—a 3-Tube Filter Rig

ON occasion we've all heard the complaint "I'd be on s.s.b., but it's too expensive" — or "It's too complicated." Comments such as these, plus the desire to do a little experimenting with high-frequency crystal filters and VXOs, prompted the development of the "Imp"; I needed an exciter with a minimum number of tubes to use as a laboratory for my experimentation.

The results have been most encouraging. The three tubes and filter generate a very acceptable s.s.b. signal, with variable frequency and a watt or so of output to drive a linear amplifier. I hope this article will inspire others to give s.s.b. a try.

For purposes of simplification this exciter is designed to operate only on 20 meters. However, by the proper choice of filter frequency, VXO crystal, and suitable modification of the three coils it can be made for any band. Components are readily obtainable on the surplus market and substitutions are quite in order where necessary. I was able to purchase crystals for less than twenty-five cents each. The modulation transformer can be any small plate-to-line unit with a turns ratio of about six or eight to one, such as the W2EWL type¹ or the output transformer from an ARC receiver. Suitable transformers are currently advertised in *QST* and other publications at a cost of less than one dollar.

Since my own station exciter is a version of George Bigler's "Sideband Package,"² and since I had already won a war against its "bugs," I decided that George's basic circuit was a good starting point. It has worked out well.

When a single-sideband generator is stripped to essentials, there isn't much to it; the complications pile on when assorted accessory equipment is added. Here's a basic unit that will get you off to a good start on s.s.b. Built mostly from odds and ends of surplus, including the crystals, it doesn't leave much room for argument on the question of economy.

Every effort has been made to keep circuits simple and with as few parts as possible. These circuits are not original with me and complete descriptions can be found in the handbooks. I have only adapted them to the Imp.

Circuit and Construction

The triode section of V_1 , Fig. 1, is used as an untuned crystal oscillator to feed carrier to the diode balanced modulator. The pentode section of this same tube will deliver enough audio from a crystal microphone to upset the modulator balance and furnish a double-sideband signal to the filter, which passes only the upper sideband to the triode mixer, V_{2A} . The pentode section, V_{2B} , is a variable-frequency crystal oscillator which supplies the mixing signal to the grid of V_{2A} . About 10- to 12-ke. shift can be expected from an 8-Mc. crystal. The 6CL6 amplifier, V_3 , uses tuned tanks in both the grid and plate circuits to provide adequate selectivity.

Construction is straightforward. A 5 X 7-inch chassis was used, with the filter mounted on top. A shield separates it from the VXO tuning cap-

* 4318 Hanover Ave., Richmond 21, Virginia.

¹ Vitale, "Cheap and Easy S.S.B.," *QST*, March, 1956.

² Bigler, "A Side-Band Package," *QST*, June, 1958.

acitor. A reasonable effort should be made to keep the circuits separated. If the unit is not to be put in a metal box, I would suggest putting a shield can over the carrier crystal and over the filter, because hand capacitance tends to throw the carrier balance out of kilter.

The selection of crystals for the filter permits a wide latitude of frequencies. However, the harmonics of the filter frequency and of the mixing frequency should be well removed from the desired 20-meter output.

Selecting Crystals

On the surplus market are several groups of 5- to 9-Mc. crystals that have a frequency difference of 1.7 kc. I obtained about ten at 5773.3 and ten more at 5775 for experimenting, but I now feel that for a similar project seven at 5773.3 and three at 5775 would be enough. While the crystals are marked as having these frequencies few of them are "on the nose," and you will find that they will differ from one another by as much as a kilocycle.

Mark each of the 5773.3 crystals with an identifying letter and determine the relative frequency of each by inserting them one at a time in the crystal socket of V_1 and tuning them in on your receiver. If your receiver covers only the ham bands, use a second crystal at approximately 8500 kc. in the VXO to bring the sum frequency to the 20-meter band. A difference in audio tone against the receiver b.f.o. will permit you to get the crystals in order of frequency from highest to lowest. Record this order by the letters previously marked on them.

Select two of the lower-frequency crystals of the 5773.3-ke. group having a separation of a couple of hundred cycles or so and call the lower one Y_4 and the higher Y_2 . You will later use one of the remaining crystals of this group for Y_1 . Use one 5775-ke. crystal for Y_3 . Peak T_1 and the trimmers on T_2 with a 5775-ke. crystal at Y_1 .

Circuit and Filter Alignment

The three tuned circuits, L_2 , L_3 , and L_4 , can

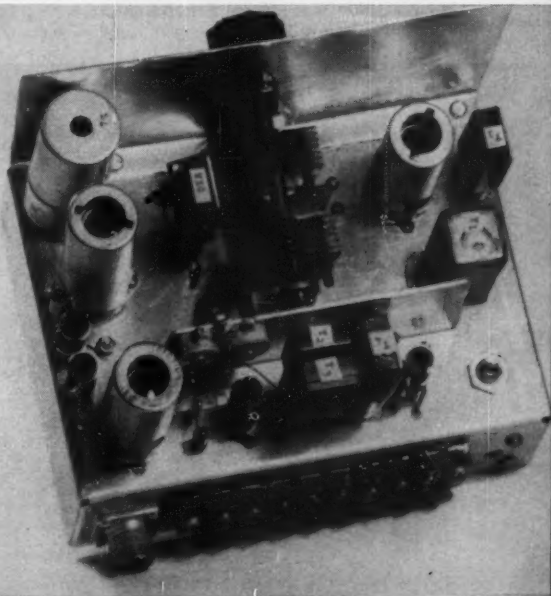
best be aligned by first removing both Y_1 and the VXO crystal and then, with a signal generator set at 14,300 kc. connected to the grid of V_{2A} , peaking the coils. An alternate method would be to use a 7150-ke. crystal in the VXO and peak the coils on its second harmonic. This procedure should be followed to avoid the possibility of alignment of the coils on a harmonic of the VXO or a harmonic of Y_1 .

Alignment of the filter is the next step, and a BC-221 frequency meter or other slow-tuning oscillator is necessary. I used a 221 on its low range, which gives approximately 30 dial divisions per kilocycle. Insert a crystal about 150 to 225 kc. lower than the passband frequency at Y_1 ; this would be in the 5550- to 5625-ke. range. Exact frequency matters little as long as the 221 output and the temporary Y_1 add to tune across the filter passband. A difference frequency may also be used if you remember that in such case increasing the 221 frequency decreases the resultant frequency.

Connect a capacitance of a few $\mu\text{f.}$ between the output terminal of the 221 and a shielded lead running to the arm of the carrier-balance potentiometer, R_2 , which should be turned to one end of its rotation. Remove the 6CL6 from its socket and connect a lead from the ungrounded end of L_3 to your receiver antenna terminal. You should be able to get an S-meter reading on the 20-meter band. If the meter goes off scale, loosen the coupling between the Imp and the receiver until a mid-range reading is obtained. You are then ready to plot the passband.

Tune the 221 so that the output frequency of the diode balanced modulator, which is now acting as a diode mixer, sweeps across the filter passband. Keep the receiver in tune with the signal and observe the action of the S meter. It takes a little practice, but after a few moments of using one hand on the receiver and one hand on the frequency meter this process becomes quite easy. You should be able to observe a definite increase in S-meter readings within the passband and a decreased reading outside of the passband.

Behind the panel. Most of the parts are from surplus. L_1 is in the can (from a roll of film) at the upper left. Following down along the left edge of the chassis are the output tube, V_3 , the mixer-amplifier coupling coils, L_3L_4 , and the mixer-VXO tube, V_2 . The VXO crystal is alongside the tuning capacitor, which is 100 $\mu\text{f.}$ per section with 100 $\mu\text{f.}$ fixed in series with each section to give the 50 $\mu\text{f.}$ specified in Fig. 1. T_2 is on the coil form at the left near the rear edge of the chassis; its associated trimmers, C_2 and C_3 , are mounted on the shield alongside. The filter crystals and T_1 are also near the rear edge of the chassis. The carrier crystal is at the right in the far corner; V_1 is alongside, followed by the audio transformer, T_1 , and, in the lower right-hand corner, the carrier balance control, R_2 . C_1 is adjusted through the hole in the rear wall of the chassis at the right.



Using a sheet of graph paper, plot the S-meter readings on the vertical scale against 500-cycle dial settings from the 221 calibration book on the horizontal scale. Run a series of points and sketch in the curve. After you have plotted one or two of these curves you will be able to visualize what happens to the passband by watching the S-meter action after each adjustment of the filter trimmers. It will only be necessary to plot the final curve for your records.

The filter passband of the Imp is shown in Fig. 2. It has a very sharp cutoff on the low-frequency side and is suitable as a filter for the upper sideband for transmission, but is too wide for receiving purposes. The curve has a dip and a bump or so, but they do not seem to affect the speech quality too adversely. Final filter adjustment will be a compromise between flatness of passband and maximum suppression of the unwanted sideband.

Carrier Balance

There should be little trouble with the carrier balance. If the trimmer, C_1 , does not add to the carrier suppression that can be obtained by adjusting R_2 , connect it at the other diode. This is a matter of cut and try. You will find that different crystals at Y_1 require different settings of R_2 and C_1 . Any r.f. indicator, such as an r.f. probe and v.t.v.m. or a receiver S meter, can be used for setting the balance. Be sure S_1 is closed.

Selecting Y_1 is also a bit of cut and try. If its frequency is too low you will find that the sideband suppression is excellent, but the signal is difficult to copy because the low voice frequencies are cut off by the filter. If it is too high, the signal will sound fine, but you've lost suppression of the unwanted sideband. Don't be afraid to move the frequency around a bit by loading the crystal with a pencil mark. The final frequency of Y_1 should be as low as possible consistent with good voice quality.

Other Bands

Operation on other bands may be accomplished by using this same filter. For example, lower-sideband output at the high-frequency end of the

75-meter band can be realized by (1) replacing the VXO r.f. plate choke with a parallel-tuned circuit at 9760, (2) using a 4880-ke. VXO crystal, and (3) changing L_2 , L_3 , and L_4 to tune to 3980 ke. You could leave the plate choke alone and obtain a fundamental crystal at about 9760 ke.

In any frequency combination that may be used, the sum of the filter frequency and the mixing frequency gives output on the original (in this case the upper) sideband. Subtracting the mixing signal from the filter frequency will still give you upper-sideband output. However, if the sideband filter frequency is subtracted from the mixing frequency, a reversal will occur and the output will be on the lower sideband.

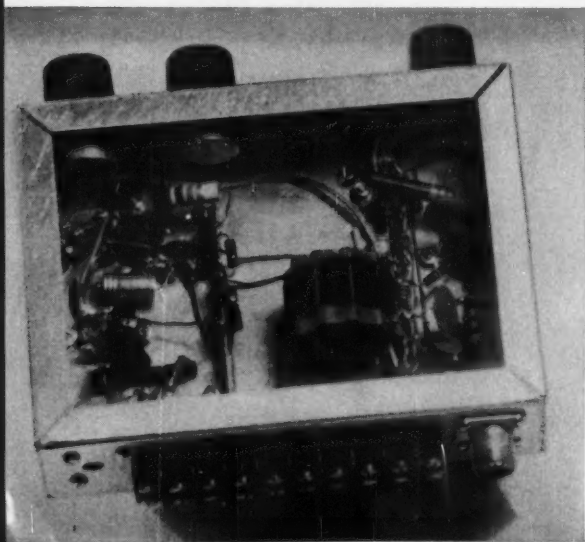
I made an attempt at 15 meters using a 7825-ke. crystal, doubling in the VXO tank to 15,650 to give exciter output at about 21,423. It worked fine except that L_2 , L_3 , and L_4 did not give sufficient selectivity for adequate attenuation of the third harmonic of 7825 ke. Construction of a filter at about 4125 will permit using an 8650 crystal for better rejection of harmonics in the tuned circuits.

Build an Imp around any group of crystals you may have, but watch out for the harmonics. See you on s.s.b.!

Results and Afterthoughts

I have had the rig on the air with an amplifier, and while adequate drive is not available for my Thunderbolt, the Imp will drive a 6146 or 61DQ5 quite well. Carrier and sideband suppression are quite good. W4LYC describes it as sounding "like a well-adjusted phasing rig." I worked a number of Ws, TI2HP, and ZS6AQQ, with the Thunderbolt tied on and doing the best that it could. The VXO could probably be replaced with a v.f.o., but I have not tried it. It is quite stable with the crystals and there is no detectable drift in operation.

I would like to say here for the benefit of those without access to a BC-221 that they should not lose heart. Any existing v.f.o. can be used if it is given additional bandspread with a trimmer so that a 180-degree turn of the dial will cover about 10 ke. It doesn't even have to tune the



The large coil is L_1 , in the VXO circuit. Knob-adjusted controls are, left to right, carrier insertion, audio gain, and operate switch. The microphone jack is between the latter two. The extra contacts of the operate switch, S_2 , are brought out to the terminal strip on the rear edge of the chassis. These can be tied in with a linear amplifier and other accessory equipment as the operator may desire.

QST for

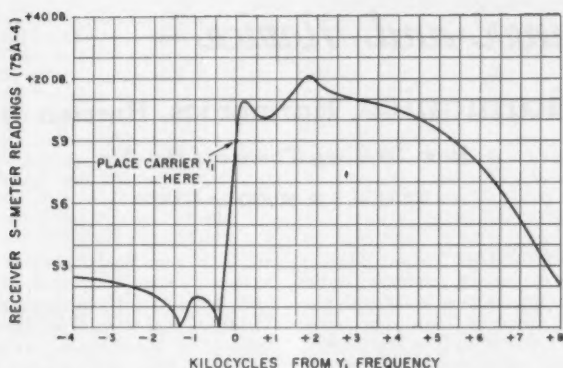


Fig. 2—Pass-band of crystal filter use in the Imp, in terms of S-meter readings on the 75A-4 receiver used by W4IMP. The frequency measurements were made by using a BC-221 frequency meter as a signal source.

filter frequency. Use the heterodyne principle as described above with the BC-221. After all, in this case we want to know only that the passband has the desired shape. A VXO on a separate chassis could also be used.

Since only one crystal, Y_3 , is needed for the higher channel, all filter crystals may be purchased for the same frequency and a couple etched or ground up $1\frac{1}{2}$ to 2 ke. This job is easier to do than one can imagine. Refer to your

handbooks. Of course, commercial high-frequency filters are available that will do a beautiful job, but this makes the task too simple and we sidebanders will lose our "exclusiveness."

The three tubes and two diodes are the best that I could do. Anybody for a two-tube exciter? A triple triode is available!

My thanks to Art, ZS6AQQ, and Myron, W4IYC, for their encouragement and ideas for this little rig. QST

Strays

FEEDBACK

The "Self-Contained Portable Station for 50 Mc. (March QST, page 11) is bringing in plenty of mail. Some of this indicates that readers don't read very carefully. About a dozen letters ask for a 2-meter version, despite a statement on the first page of the article giving the reasons for using 50 Mc. instead of 144 for this kind of work.

Several inquiries concern the 1AF4 tubes. Ours were made by Sylvania, and obtained from a local radio parts store. They are among the newer filament-type tubes, but have been made for several years.

Some ask about the small transformers. Don't worry if you don't find exact duplicates of those used in the article. There are many makes of transistor transformers on the market. The impedance values are not too critical. Anything roughly approximating the impedances given under Fig. 1 should be satisfactory.

Sharp-eyed W5VCJ asked if there isn't a continuous drain on the transistor battery, with the circuit as shown, even with S_2 open. We blushing admit that there is—though it is not a serious matter. After more than four months with the batteries connected the penlite voltages are 10 and $7\frac{1}{2}$, respectively, in place of the original 12 and 9 volts, and there is still plenty of audio available. If you want to get rid of the

200-microampere drain, return the 1500-ohm resistor in the receiver to the plus side of S_{2AS} , rather than to ground.

There is a dimension error in Fig. 2. As shown in the diagram, the two small chassis are $2\frac{1}{2}$ by $3\frac{3}{4}$ inches after bending. The large surface should be $3\frac{1}{4}$ inches long, not $3\frac{3}{4}$ inches.

The crosstown QSO of K9ORP, K9MBS and K9MBR was monitored by KN9SVV . . . on his TV set.

W1CTW/W1IQD recently worked a KP4 on 50-Mc. phone. So what, say you? Well it so happens that Cal has been an active amateur since 1924. He has a country total of 164 on 21 Mc. He has been a leading New England v.h.f. enthusiast since the earliest days of activity on 5 meters—but this 6-meter contact with Puerto Rico was his first phone QSO outside the United States and Canada.

Additional copies of the Golden Jubilee yearbook of the Radio Club of America, published earlier this year, are available at \$4.50 per from the Club at 11 West 42nd St., New York 36, N. Y.

When WA2HRD QSOd W2CTH, W2CTH said this was his 100th contact on 6 meters. WA2HRD checked—it was his 100th on 6 too.

• *Beginner and Novice —*

Harmonics, Harmonics, Harmonics

How To Keep Them off the Air

BY LEWIS G. MCCOY,* W1ICP

DEAR Mr. Newly-Licensed Novice: Whether you're aware of it or not, you must face the fact that precautions must be taken to prevent radiation of harmonics from your transmitter. If you don't, you're likely to find yourself in violation of FCC regulations. It isn't safe to assume — or hope — that you don't have harmonics. If you escape getting a ticket for a while it may just be because FCC monitors didn't happen to check at times when you were on the air.

There are several methods for getting rid of harmonics. This article will treat a simple, inexpensive cure. However, before discussing the "how" let's talk about the "why" for a minute.

Harmonics

What you want from your transmitter is a signal in which all the output power is on one frequency only. Unfortunately, transmitters don't generate that kind of signal. In addition to the desired frequency, called the "fundamental," there are always other frequencies present. These frequencies, called "harmonics," are simple multiples of the fundamental frequency.¹ For ex-

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¹ You should know this already from your Novice license examination, but it's worth repeating for emphasis.

ample, if your fundamental is 3710 kc., you'll have a "second" harmonic at twice 3710, or 7420 kc., a "third" harmonic at three times, or 11,130 kc., and so on. When these frequencies are radiated by the antenna they may cause interference to other radio services because, for the most part, they don't fall in amateur bands.

Where most Novices get into trouble is with the second harmonic from 80-meter operation. There are numerous commercial services in the region around 7450 kc., and there are often times when it doesn't take much of a harmonic from your station to interfere with the reception of one of these commercial stations.

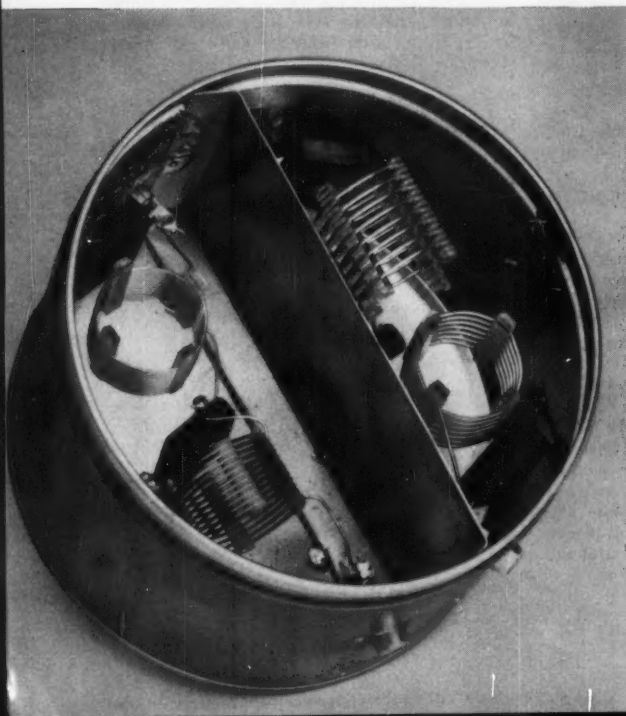
How Bad Are Your Harmonics?

There is no simple method for determining whether your harmonic radiation may cause harmful interference. You can have another ham listen for your harmonics; if he hears them at all you know you have to do something about them, but unfortunately the converse isn't true: the fact that another ham cannot hear a harmonic from your station doesn't mean you are clean. The only safe assumption to make is that your transmitter is bound to have harmonics, and then take precautions to prevent them from reaching the antenna.

Many of the antennas in use on 80 and 40 are of the trap type with coax feed. In this type of installation the coax feed line is usually connected directly to the transmitter. In such case you can be practically certain that harmonics will reach the antenna and be radiated. Another common system is the off-center feed antenna, usually fed with 300-ohm Twin-Lead, connected to the transmitter through balun coils and coax. Here again there is nothing to prevent harmonics from reaching the antenna.

Whether you use the antenna

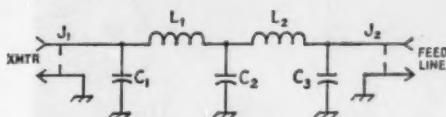
The two-band filter for coax lines; 80-meter filter at left, 40-meter filter at right. The coils in each filter are self-supporting and are oriented with their axes at right angles.



QST for

Fig. 1—Circuit of the half-wave filter. A single set of circuit constants, as given below, will serve for one Novice band, but different filters must be used on different bands.

- C_1, C_3 —3.5 Mc.: 820- $\mu\text{mf.}$ mica, 500 volts.
 7 Mc.: 470- $\mu\text{mf.}$ mica, 500 volts.
 21 Mc.: 100- $\mu\text{mf.}$ mica, 500 volts.
 C_2 —3.5 Mc.: 1500- $\mu\text{mf.}$ (0.0015 $\mu\text{f.}$) mica, 500 volts.
 7 Mc.: 1000- $\mu\text{mf.}$ (0.001 $\mu\text{f.}$) mica, 500 volts.
 21 Mc.: 2000- $\mu\text{mf.}$ (0.002 $\mu\text{f.}$) mica, 500 volts.
 J_1, J_2 —Phono jacks.



- L_1, L_2 —3.5 Mc.: 11 turns No. 20, 16 turns per inch, 1-inch diam. (B&W Miniductor 3015).
 7 Mc.: 8 turns No. 18, 8 turns per inch, 1-inch diam. (B&W Miniductor 3014).
 21 Mc.: 7 turns No. 18, 4 turns per inch, 1/2-inch diam. (B&W Miniductor 3001).

systems just mentioned or some other type, as long as you don't have an antenna coupler or some type of filter in the feed line you should take precautions against harmonic radiation. Some amateurs think that a low-pass filter for TVI will protect them against all kinds of harmonic radiation. A TVI filter will help attenuate harmonics in the television range, but it won't do a thing for the low-frequency harmonics that interfere with other commercial services.

Usually you can consider yourself safe if you have an antenna coupler following the transmitter. The coupler provides enough selectivity to keep the harmonics from being radiated. However, many amateurs don't like to use a coupler because of the additional adjustments required when changing bands. There is another approach to the problem of harmonic attenuation, and that is the use of a filter installed in the coax feed line. The filter is a fixed device that doesn't require adjustment or tuning once it is constructed.

Half-Wave Filters

A "half-wave" filter is a special type which has the unique property that it doesn't have to be "matched," because whatever impedance may be connected to its output side will automatically be repeated at its input terminals. This means that such a filter can be inserted in the feed line without changing the load on the transmitter; except for the fact that it attenuates harmonics such a filter has no effect on the operation of the transmitter and antenna.

The half-wave filter is not critical of the standing-wave ratio on the line. A single design will work equally well with either 50- or 70-ohm coax and will tolerate mismatches of approximately 3 to 1. This limit is not due to any theoretical limitations in the filter itself, but is because of the limitations of the components used. With a large mismatch the currents or voltages in some parts of the filter may exceed safe values for the coils and capacitors.

The only drawback, and it is not a serious one, is that a separate filter is required for each band. This means the filter must be changed when a different band is used. However, this can be taken care of by installing phono-type plugs on the feed line and phono jacks on the filter. It is impracticable to use a switch to change filters because of the danger that harmonics will leak around the switch connections through

stray capacitance and reach the antenna. It only takes a few seconds to change filters with the plug and jack system.

Making the Filters

The assembly shown in the photograph consists of two half-wave filters, one for 80-meter operation and the other for 40. A coffee can makes an inexpensive container for the filters, and also offers excellent shielding. Both filters use the circuit given in Fig. 1.

The first step in building such a filter is to cut a shield from another tin can. The shield runs through the center of the coffee can and is soldered to the can at the sides and bottom. This separates the can into two shielded compartments.

Next, mount the phono jacks in place. These are installed approximately 1 1/2 inches from the bottom of the can and about 3/4 inch either side of the shield. The jacks can be installed by soldering them directly to the can, or else screws and nuts can be used.

The coils L_1 and L_2 are made from a single length of B & W Miniductor coil stock. See Fig. 1 for details on coil sizes. When cutting the coils from the original stock allow approximately 1 1/2-inch lead length on each coil.

Note in the photograph how the coils are mounted at right angles to each other. This is done to minimize coupling between the coils. The ground leads to the mica capacitors are soldered directly to the can, and their other leads go to J_1 , J_2 and the junction of L_1, L_2 , respectively. After assembly, replace the lid to complete the shielding.

Of course, if you plan to operate only on one band there is no need to make two filters. In such a case the internal shield can be omitted.

The half-wave filter attenuates all harmonics higher than its operating frequency and so is also useful in attenuating harmonics that could cause TVI. However, if you already have a TVI low-pass filter installed in your setup it can be left in place when the half-wave filters are used. Actually, there is no need to build a half-wave filter for 15-meter operation if you're already using a low-pass filter since the latter serves the same function.

Remember: Be sure to change filters when changing bands. If you don't you may blow out the mica capacitors.

QST

"The entire installation . . . was completed in 15 minutes"

A Portable Mast for Small Beams

This 24-foot portable mast is easily made from readily-obtainable and inexpensive material. Its worth was proved in 1959 Field Day operations.

Simplest Is Best

BY BOB JONES,* W9DWD

SIMPLEST is best," is a good slogan to keep in mind when preparing an antenna system for Field Day. Or, for that matter, for any portable operation.

With some help from George Saif, W9BDM, the author constructed the v.h.f. antennas and supporting mast for the local club's 1959 Field Day.¹ This article deals mostly with the construction of the mast and the means employed for rotating the antennas. Little comment is made about the antennas, since there are many good beams described in the ARRL *Handbook* and *QST*. Almost every amateur has his own preference in the antenna department.

It was decided not to use an electrically-operated rotator, since electric power is at a premium on Field Day. As it worked out the Armstrong method was quite satisfactory. This type of rotator is the cheapest and most readily available. For those unfamiliar with the Armstrong rotator, it is the same as turning by hand.

Construction Details

For the mast, three wood poles 8 feet long were used, the combined height being 24 feet. These poles are approximately 1 3/4 inches in diameter and came from a convention display booth. Poles like these are readily available at your local lumberyard or, in some areas, come with rugs rolled on them. The 8-foot length was chosen because it permits carrying the mast, when collapsed, inside a station wagon. The simplest type of portable and Field-Day antenna mast is the one you can carry around with the least amount of trouble.

The three poles are butted together and joined

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¹Chicago Suburban Radio Association, W9SW/9.

by sleeves consisting of 1-foot lengths of 1 1/2-inch pipe. The wood poles were whittled and sand-papered until they fitted tightly into the ends of the pipe. With the poles inserted into the pipes, holes were drilled and 3/4-20 bolts passed through the pipe and pole to keep the poles from slipping in the pipe. To disassemble the mast, the bolts are removed and the entire mast reduces to an 8-foot bundle. From the photographs, it can be seen that the top 8-foot pole section is used as the mast for the 2-meter and 6-meter beams. The entire mast is guyed at the pipe coupling just below the top pole, at 16 feet above ground.

Guying and Rotating

The mast rotates by means of a unique and inexpensive slip ring. The top 1-foot section of pipe coupling was threaded at its upper end, and a 2-inch-to-1 1/2-inch pipe reducer was screwed on. With the 2-inch end of the reducer upward, the top wood pole easily passes through the reducer and into the 1-foot pipe. The wide lip on the 2-inch side of the reducer acts as the bearing surface for the slip ring. The slip ring is a 1 1/2-inch wall flange. The hole through the middle of this flange is actually about 1 3/4 inches and easily fits over the wood pole and rests on top of the reducer. The flange has four equally-spaced holes in it where guy ropes may be attached. The guy ropes hold the wall flange rigid as the mast turns. The friction between the wall flange and the wide lip of the reducer was found ample to keep the beams and mast from turning in the wind. All pipe fittings used are readily available at your local hardware store, as is the clothesline rope we used for guy lines.

I would suggest that if you build a similar type of rotating mast with more than three poles, you

The wood sections of the mast are coupled together with sections of pipe secured by bolts. This detail view also shows the pipe reducer and wall flange mentioned in the text.

QST for

This view shows the mounting of the two antennas and the guy-rope bearing.

should add additional slip rings and guys at the middle to keep the mast from bowing. The additional slip rings can be made in like manner.

Antennas

For 6 meters the author used a 3-element beam. The elements are aluminum tubing and quickly unfasten from the wood boom by removing two bolts in each. The boom is attached to the wood mast by a U bolt. This type of construction permits the entire 6-meter beam to be reduced to a small flat package. There are many good commercial beams available that can be used, but keep in mind that the simplest are the easiest to take apart and transport to the portable site.

For 2 meters, an 8-element collinear broadside beam was built. This, like the 6-meter beam, is a familiar type of antenna and is described in the *Handbook*. The only point of interest is the method of attaching it to the wood mast. The crosspieces, each supporting two bays, consist of strips of 1 X 1-inch board spread 1 1/4 inches apart. Bolts on either side of the mast, through the strips, clamp the strips tightly to the wood mast. Wire was used in the phasing section between the upper and lower bays so that the beam would lie flat when removed from the mast, and so the phasing section would not have to be disconnected when disassembled. A coax fitting was soldered in the feed line just below the balun to

permit easy removal of the feed line when not in use.

Summary

This rotating mast and antenna system worked even better than expected. As anticipated, there was never a lack of available hams to run over and swing the beam. The 24-foot mast was found to be ample for the beams, considering the ideal hilltop location the CSRA club used last year. The complete installation of beams, mast, guys and feed lines was completed in less than 15 minutes. All of the parts were easily carried to the Field-Day site inside the author's station wagon.

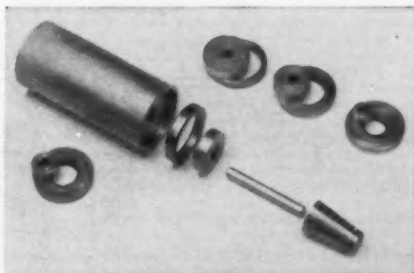
In conclusion, the antenna system was simple to build, easy to assemble and put up and, best of all, operated with no difficulty. All of the materials are available at your local lumberyard or hardware store, if not in your junk box, and the total cost is low for an installation of this caliber. Once again, I believe that "Simplest is best," is a good slogan for Field Day. QST

● New Apparatus

Six-in-One Chassis Punch

THE problem of storing and using several different sizes of chassis punches can be solved by using a 6-hole chassis punch manufactured by Punches, Box 415, Toledo, Ohio. With this tool, holes of 1 1/8, 1, 3/8, 3/4, 5/8 and 1/2 inches can be cut in aluminum chassis.

The photograph shows an exploded view of the tool along with assorted punches and dies. The large cylinder at the left is the die holder. Next to it is the die, punch, locating pin and the driver which doubles as the 3/4-inch punch. Before using the tool it is necessary to drill a 1/4-inch pilot hole in the chassis. The desired die is then placed in the die holder and lined up with the pilot hole in the chassis, after which the locating pin is inserted through the pilot hole and down into the die holder. A punch of the proper size and the driver are next placed over the locating pin, and a few blows with a hammer on the driver forces the punch through the chassis.



When assembled, the punch measures about 6 inches high and about 1 1/4 inches in diameter. It is mailed in a strong cardboard tube with a metal screw-on cap which makes a handy container for storing the tool.

— E. L. C.

S.S.B. on 144 Mc. with the T-23/ARC-5

BY LEROY W. MAY, JR.,* W5AJG

THE T-23/ARC-5 has been a popular v.h.f. transmitter for years. Here we have a modification of the unit that permits use of its last two stages as single-sideband mixer-amplifier. It delivers enough power to be effective on its own, or it may be used to drive a kilowatt amplifier. At W5AJG it is used as an exciter for all classes of 144-Mc. service, driving a pair of 4X250Bs at 600 watts input on a.m. phone and 1 kilowatt on c.w. and s.s.b. The conversion described was worked up for the Air Force MARS Central Technical Net, Texas Division.

Several methods can be used to convert the T-23/ARC-5 to s.s.b. service. If only low s.s.b. output is wanted, the last 832A stage can be modified for mixer service. This will give enough output to drive a tetrode linear amplifier to several hundred watts, but it is not recommended unless some form of high-Q tuned circuit is inserted between the mixer and the amplifier, in order to hold down the level of spurious drive applied to the final stage. If the first 832A is used as the mixer and the second operated as a linear amplifier more output will be obtained, and the

selectivity of the additional tuned circuits helps keep down the level of unwanted mixer products.

The s.s.b. exciter can be anything that will deliver a few watts. With the arrangement shown the s.s.b. excitation is on 21 Mc., though it could be on other amateur frequencies if the heterodyne frequency is suitably altered. The higher the s.s.b. frequency, the easier it is to get rid of the unwanted products. Injection of the s.s.b. energy was tried in the control grid, the screen and the cathode of the first 832A, with very little difference in results. Cathode injection is shown in Fig. 1.

Probably the simplest way of obtaining the heterodyning energy is to build a separate unit, rather than attempt to modify the 1625 oscillator and multiplier stages in the ARC-5. In this way the original stages can be left more or less intact, and the unit can be put back into service in its original form with a minimum of trouble. A 2-tube oscillator-multiplier circuit is shown in Fig. 1.

The screens of the 832As are run from a regulated source. This can be drawn from the supply for the plates. The oscillator and multiplier

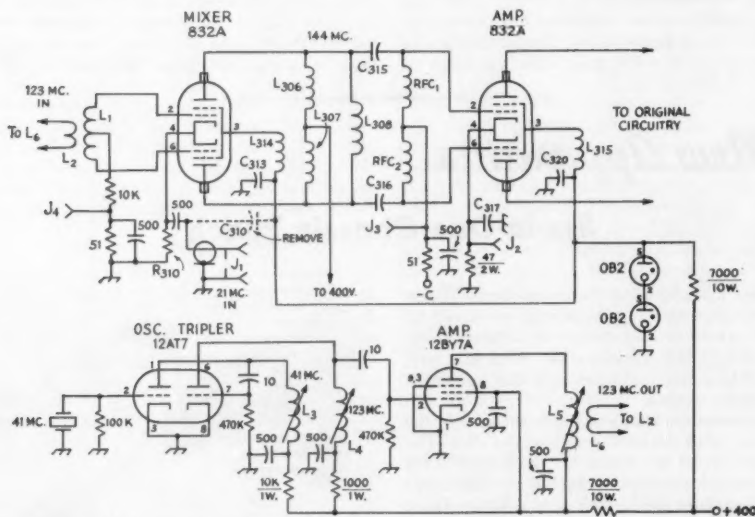


Fig. 1—Circuit of the ARC-5 v.h.f. transmitter, as converted by W5AJG for 144-Mc. s.s.b. operation. Three-figure part numbers indicate original components. Capacitor values are in μf . Resistors are $\frac{1}{2}$ watt unless specified.

J₁—Coaxial chassis fitting, SO-239.

J₂, J₃, J₄—Tip jacks for metering.

L₁—10 turns (total) No. 18 tinned, $\frac{7}{16}$ -inch diam., $\frac{1}{2}$ inch long, each side of center tap. Space $\frac{3}{16}$ inch at center. Mount on ceramic bar in ARC-5.

L₂—2 turns insulated hookup wire, inserted at center of L₁. Twist leads to run to L₆.

L₃—12 turns No. 26 enam., $\frac{3}{16}$ inch long on $\frac{3}{16}$ -inch slug-tuned form.

L₄—4 turns No. 22 tinned, $\frac{1}{2}$ inch long on $\frac{3}{16}$ -inch slug-tuned form.

L₅—6 turns like L₄.

L₆—2 turns like L₂, at cold end of L₅.

RFC, RFC₂—V.h.f. r.f. choke.

stages are also fed from the 400-volt source, through dropping resistors.

Stability can be improved if the oscillator plate voltage is obtained from a separate source, and the oscillator is allowed to run all the time. Some users employ a simple selenium rectifier supply, with its output regulated at 105 volts for this purpose, instead of drawing the oscillator, multiplier and amplifier voltages from the one supply, as shown in Fig. 1. Another advantage of this arrangement is that it enables the operator

to v.f.o. in on the frequency of a station without putting a signal on the air. Using a 10B or 20A in the *calibrate* position, and with the oscillator running all the time, enough mixing takes place to make a signal audible in the receiver, even with no plate voltage on the other stages.

Bias for the second 832A is obtained by rectifying the a.c. line voltage. A 50,000-ohm potentiometer controls the output voltage from the filter. It can best be set by watching the pattern on an oscilloscope.

NEW BOOKS

Servicing Transistor Radios, by Leonard D'Airo. Published by Gernsback Library, Inc., 154 West 14th St., New York 11, N. Y. Library Book N. 76. 5½ by 8½ inches, 224 pages, including index. Price, paper cover edition \$2.90; hard cover edition \$4.60.

Although written primarily for the service technician, this book also contains information of general interest to the amateur, such as the problems encountered in repairing printed-circuit boards and the treatment and salvaging of transistors, and contains a data table on the latest transistors and their characteristics. The nine chapters in the book cover transistor fundamentals, servicing transistor radios, automobile radios, tests and measurements and transistor circuits. The last chapter is full of practical diagrams for transistor receivers—superheterodyne, t.r.f. and regenerative. The book also includes interchangeability charts and a dictionary of transistor terminology.—E. L. C.

The Junction Transistor and Its Applications, by E. Wolfendale. Published by The Macmillan Company, 60 Fifth Ave., New York 11, N. Y. 6½ by 9¼ inches, 394 pages, including index. Cloth cover. Price, \$7.50.

A comprehensive work of several contributors, this book covers semiconductor devices and their applications. Written for the student as an introduction to the junction transistor, it includes the physics of p-n and p-n-p structures and design of circuits around the transistor. Typical chapters include information on direct-current biasing and audio-frequency amplification, class C amplification, sinusoidal oscillators, amplitude modulation and demodulation, and transistor d.c. converters. The book ends with an appendix of transistor measurements and a very complete index. It is especially useful for those who are concerned with the design of transistor circuits.—E. L. C.

Principles of Transistor Circuits, by S. W. Amos. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 5½ by 8½ inches, 176 pages, paper cover. No. 241. Price, \$3.90.

This book begins with an introductory chapter on the physics of transistors but from there on deals mostly with transistor applications. In fact, the bulk of the book is devoted to showing how to find such quantities as input resistance, stage gain, optimum load, power output, values of coupling capacitors and transformer-winding inductances. Illustrated with numerical examples, the mathematics is confined to simple algebra. The book also contains details on transistor relaxation oscillators, photosensitive devices, superheterodyne receivers, amplifiers and bias stabilization.—E. L. C.

Metallic Rectifiers and Crystal Diodes, by Theodore Conti. Published by John F. Rider Publisher, Inc., 116 West 14th Street, New York 11, New York. 5½ by 8½ inches, 152 pages. Price, paper cover edition \$2.95.

Here in one book is information on historical background, manufacturing techniques, basic circuit design and testing procedures for judging quality of new and used metallic rectifiers and crystal diodes. The application section gives circuits with explanations of such devices as modulators, battery chargers, power supplies, are suppressor circuits, limiters, clippers, meters and measuring circuits. There is a comprehensive appendix with useful information on standards for coding industrial dry disc rectifiers, and a complete listing of silicon and germanium diode specification data.—E. L. C.

Shortwave Propagation, by Stanley Leinwoll. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 5½ by 8½ inches, 151 pages, including index. Paper cover, price, \$3.90.

The author of *Shortwave Propagation* is in charge of frequency and propagation matters for Radio Free Europe, and his considerable experience in the field is evident in his practical approach to the subject. The book is written at just the right level for the amateur interested in ionospheric propagation—not garnished with technicalities principally of interest to the physicist and engineer, but not at the opposite extreme of popularization without real information either.

There is of course the usual background material—necessary for an understanding of the subject—on the ionosphere, on radio waves, on sunspots and the sunspot cycle, all treated in language that is easy to follow. The section on ionosphere measurements introduces the ideas that are important to the detailed understanding of ionospheric propagation, leading to the use of ionospheric charts and predictions for the determination of maximum usable frequencies and optimum working frequencies. The calculation procedure for distances shorter than the maximum one-hop, generally neglected in amateur literature, is also included.

Of special interest to QST readers are chapters on amateur contributions to knowledge of wave propagation and a forecast—advanced with admitted caution!—of probable amateur-band conditions during the coming sunspot cycle. Throughout the book the reader is introduced to various interesting aspects of propagation: one-way skip, for example, scatter, meteors, auroral effects—all the things that hams continually encounter in everyday operation. It would be hard to find a question about propagation in the 3-30 Mc. region—at least the type of question that an amateur would ask—that isn't covered somewhere in this book, even if only (of necessity) by the statement that the answer hasn't yet been discovered.—G. G.

Measuring Small R.F. Voltages

A Vacuum-Tube Voltmeter R.F. Probe

BY KENNETH C. LAMSON,* WIZIF

If you own a vacuum-tube voltmeter—a basic test instrument that is indispensable for anyone doing his own experimenting—and haven't equipped it with an r.f. probe it's probably just because of neglect, not cost. Even so, the probe described here is cheaper to make than any probe kit you can buy. It's a bare junk box that won't supply most, if not all, of the parts.

A USEFUL addition to the test gear of any ham who does experimenting is an r.f. probe. It has numerous applications, ranging from measuring oscillator injection voltage in a mixer stage to measurements on transmission lines. All r.f. probes have a common purpose—detecting and rectifying an a.c. voltage and delivering a proportional d.c. voltage to a vacuum-tube voltmeter. There are several types of rectifying probes, variously designed to read peak-to-peak, peak, or r.m.s. a.c. voltages at frequencies as high as 3000 Mc.

Either a vacuum-tube or crystal diode can be used as the rectifier. Vacuum-tube diodes can handle larger amplitudes of a.c. voltages than crystal diodes; and, in general, probes designed using vacuum-type diodes offer higher input impedance. However, the vacuum-tube probes have several drawbacks; they are relatively large and cumbersome, require heater and plate supplies, and usually have relatively high shunt capacitance. The use of a crystal diode instead of a vacuum tube simplifies probe construction, eliminates the need for a filament and plate supply, reduces shunt capacitance, and allows the finished probe to be more compact and lighter than would be possible using a vacuum-tube rectifier.

The probe shown in the photograph and schematically in Fig. 1 is of the peak-indicating, shunt type—so named because the diode is shunted across the circuit being measured—and uses a 1N34A germanium crystal diode rectifier.

* Laboratory Assistant, QST.

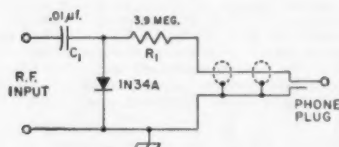


Fig. 1—The r.f. probe circuit.

Circuit Operation

A probe of this type has definite limitations, and in order to appreciate them it is necessary to understand how the probe functions. The operation of the r.f. probe is analogous to that of an ordinary half-wave rectifier-filter combination, converting an a.c. input voltage to a pure d.c. output voltage. Referring to Fig. 2, assume that

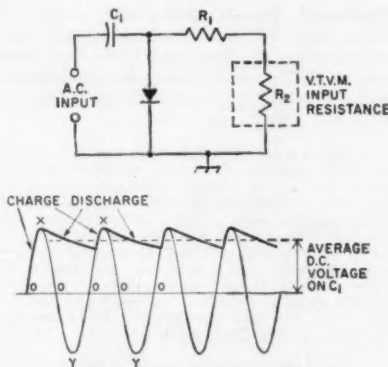


Fig. 2—How the probe operates.

the a.c. input voltage is sinusoidal. Initially, when the voltage rises from zero and approaches its peak positive value (at point X) the diode conducts and the input capacitor C_1 charges through the low forward resistance of the diode to approximately the peak voltage. When the input voltage decreases from its peak value toward zero, C_1 begins to discharge through the series combination of R_1 and R_2 , the latter being the vacuum-tube voltmeter's input resistance. C_1 continues to discharge throughout the rest of the cycle, through O to Y in the negative direction and back to O again, but if the time constant¹ of the circuit is large compared with the time of one a.c. cycle the capacitor will lose only a small part of its charge. Thus when the input voltage again goes in the positive direction the diode is back biased, and cannot conduct until the amplitude of the input voltage exceeds the potential of the partially-discharged capacitor. In each succeeding cycle, as the input voltage

¹ See *The Radio Amateur's Handbook*, chapter on circuit fundamentals. The time it takes for a capacitor to lose 63.2 per cent of its initial potential is defined as the time constant. The time constant in seconds is equal to the product of the capacitance in $\mu\text{f.}$ by the resistance in megohms. The smaller the RC product the less time it takes for the capacitor to discharge.

near its maximum positive value and overcomes the voltage stored in C_1 , the diode conducts and C_1 again charges rapidly through the low forward resistance of the diode.

Theoretically, R_1 and R_2 should be the only discharge path for C_1 ; however, in the practical case — and particularly when crystal diodes and not vacuum tubes are employed — it is possible for C_1 to discharge partly through the back resistance of the crystal diode. The back resistance is normally about 1000 times the forward resistance, but is generally small compared with the sum of R_1 and R_2 . Thus the time constant of the circuit actually is determined principally by the crystal back resistance.

Realizing basically how the probe functions, it should be evident that at some low input frequency the applied voltage will not change rapidly enough to keep the input capacitor C_1 charged to approximately the peak voltage over the whole cycle. In other words, C_1 will have time to discharge more than it should, and the average d.c. voltage from the probe will be proportionally reduced. This will cause erroneous readings, limiting the usefulness of the probe at low frequencies. For satisfactory operation the time constant of the circuit (C_1 times the back resistance of the diode) should be 25 to 100 times as long as the time of one cycle of the lowest desired a.c. input frequency, values toward the higher figure being preferable. The actual back resistance of the diode is dependent on the applied voltage, but an average figure of 150,000 ohms can be used for general calculation purposes. Thus, for the circuit shown in Fig. 1 the lowest usable frequency of the probe is approximately:

$$f = \frac{100}{R_b C_1} = \frac{100}{0.15 \times 0.01} \\ = 66,700 \text{ cycles or } 66.7 \text{ kc.}$$

where f is the frequency in cycles per second and R_b is the crystal back resistance in megohms. Increasing the capacitance of C_1 will extend the lower frequency limit of the probe.

The upper frequency limit for a probe of this type is approximately 250 Mc. The mechanical design and construction can markedly influence the performance of the probe in this respect. Long leads and wiring in which no attention is paid to stray capacitance will considerably reduce the over-all effectiveness of the probe at the higher frequencies. At high frequencies it is also essential to provide short, low-inductance r.f. connections to the test circuit. A flexible

copper-braid grounding strap will provide a low-inductance return path. In general, at the upper frequencies the usefulness of the probe is limited mostly to detecting the presence of r.f. voltages and comparing relative amplitudes, rather than in making accurate quantitative voltage measurements.

The capacitor C_1 charges to the peak amplitude of the applied voltage, as described earlier, but usually it is desired that the r.m.s. values of the voltage be indicated. To do this automatically, it is necessary to set up a resistance voltage divider to convert peak to r.m.s. The r.m.s. value of a sine wave is 0.707 times the peak, and therefore this ratio is used in the voltage divider, the resistance across which the d.c. voltage is measured being 0.707 times the total resistance; that is,

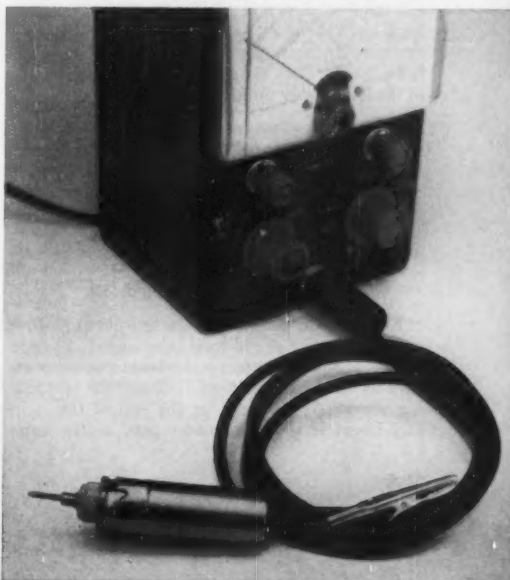
$$\frac{R_2}{R_1 + R_2} = 0.707$$

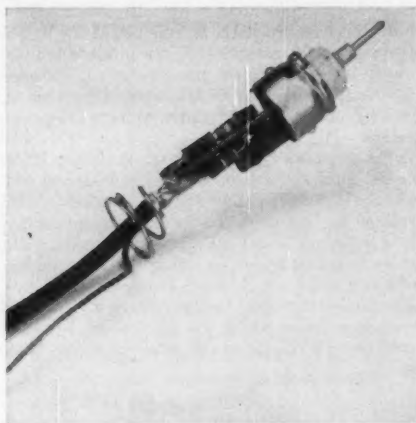
where the circuit is as shown in Fig. 2. The probe described here is designed to be used with any of the several "11-megohm" vacuum-tube voltmeters on the market (the actual input resistance of these meters is 10 megohms since the d.c. probe contains a 1-megohm isolating resistor). Solving the equation gives $R_1 = 0.414R_2$, and substituting 10 megohms for R_2 yields 4.14 megohms for the value of R_1 . Keeping in mind that the average of the charge on C_1 is not quite equal to the peak of the input voltage, the actual value for R_1 should be chosen slightly smaller than the calculated value. In this case a value of 3.9 megohms is not only sufficiently accurate but also allows the builder to use a standard resistance value.

Construction

The unit shown in the photograph and schematically in Fig. 1 is similar in circuitry to most of the conventional peak-indicating, shunt-type commercial r.f. probes. However, it can be constructed for considerably less than the cost of a commercial unit. If all parts, including the

The r.f. probe is used in conjunction with a vacuum-tube voltmeter. The case of the probe shown here is constructed from a 7-pin ceramic tube socket and a 2 1/4-inch tube shield. A half-inch grommet at the top of the tube shield prevents the output lead of the probe from chafing. The flexible copper-braid grounding lead and alligator clip provide a low-inductance return path from the test circuit. The d.c. output of the probe goes to the phone plug, which plugs into the d.c. input jack of the v.t.v.m.





Close-up of the inside of the probe. The 1N34A crystal diode rectifier, calibrating resistor, and input capacitor are mounted tight to the terminal strip with shortest leads possible. Spaghetti tubing is placed on the diode leads to prevent accidental short circuits. The tube-shield spring and flexible-copper grounding lead are soldered to the cable braid (the cable is RG-58/U coax in this probe). The tip can be either a phone tip or a short pointed piece of heavy wire.

shielded wire (microphone cable or small coax), alligator clip, tie point, resistor, phone plug, tube socket, tube shield, capacitor, and diode are purchased new, the total cost of the unit is approximately \$2.25. Utilizing junk-box parts can decrease the total cost substantially.

The isolation capacitor, crystal diode, and resistor are mounted on a bakelite 5-lug terminal strip, as shown in the sketch. One end lug should be rotated 90 degrees so that it extends off the end of the strip. All other lugs should be cut off flush with the edge of the strip. Cut off about an inch of the outer insulation of the cable, unravel the braid three-quarters of an inch, slip a piece of spaghetti over the free end of the braid, and then solder its end to the ground lug on the terminal strip, as shown in Fig. 3. Remove the spring from the tube shield, slide it over the cable, and crimp it to the remaining quarter inch of shield braid. Solder both the spring and a 12-inch length of flexible copper braid to the cable shield.

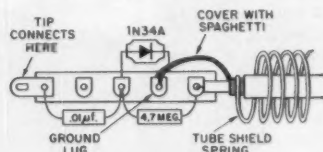


Fig. 3—Component mounting details.

Next, cut off the pins on a seven-pin miniature ceramic or mica shield-base tube socket. Be sure to use a socket with a cylindrical center post, such as the Johnson 120-277. Crimp the terminal lug previously bent out at the end of the strip and insert it into the center post of the tube

socket from the top. Insert the end of a phone tip or a pointed piece of heavy wire into the bottom of the tube socket center post, and solder the lug and tip to the center post. Insert a half-inch grommet at the top of the tube shield, and slide the shield over the cable and flexible braid down onto the tube socket. The spring should make good contact with the tube shield to insure that the tube shield (probe case) is connected to the grounded side of the circuit. Finally, solder an alligator clip to the other end of the flexible braid and mount a phone plug on the free end of the shielded wire.

Be sure to mount components close to the terminal strip, as this keeps lead lengths as short as possible and minimizes stray capacitance. Use spaghetti over all wires to prevent accidental shorts. When soldering the crystal diode, hold the end to be soldered with a pair of long-nose pliers; this helps conduct damaging heat away from the diode.

Using the Probe

The a.c. input voltage that the probe can handle safely is limited to about 21 volts r.m.s. or 30 volts peak, as a result of the 60-volt peak-inverse rating of the 1N34A crystal diode. The phone plug on the probe cable plugs into the d.c. input jack of the v.t.v.m., and r.m.s. voltages are read on the vacuum-tube voltmeter's negative d.c. scale. When using the probe be sure that any d.c. voltage on the circuit being checked does not exceed the d.c. voltage rating of C_1 (600 volts for small ceramic capacitors).

The accuracy of the probe is approximately ± 10 per cent from 50 kc. to 250 Mc. For example, if the error of the v.t.v.m. used with the probe is ± 5 per cent, then the over-all error of the measuring system is ± 15 per cent. At low values of input voltage, below a volt or so, the accuracy of the probe is somewhat poorer because of the nonlinearity of the 1N34A crystal diode. At these lower input voltages the output of the probe more closely approaches a square-law relationship than a linear one.

The approximate input impedance of a probe of this type is 6000 ohms shunted by $1.75 \mu\text{f}$. (at 200 Mc.),² and the amount of error introduced because of circuit loading by the probe is dependent on the impedance of the source of the a.c. voltage being measured. If peak values are desired rather than r.m.s., the r.m.s. values can be multiplied by 1.41 or the peak scales on the v.t.v.m. can be read directly if so calibrated.

QST

² Ghiradi and Middleton, *How To Use Test Probes*, published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y.

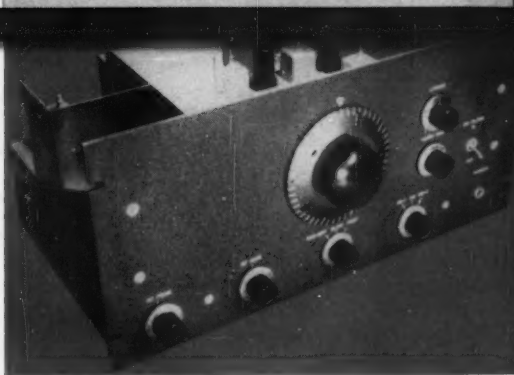
Strays

W7WDZ's XYL fixed up an indoor 29-Mc. antenna for him by taping to one wall an 8-inch wide strip of aluminum foil cut to the proper length as a half-wave horizontal dipole. Now she's thinking of adding a reflector on the opposite wall. — W7SAB

High Performance at Reasonable Cost

This thirteen-tube receiver covers 3.5 to 50 Mc., includes a ham-built lattice crystal filter, "hang" a.v.c., high-stability oscillator, and a novel product detector.

BY PITT W. ARNOLD,* W9BIY
AND CRAIG R. ALLEN,** W9IHT



Some New Ideas in a Ham-Band Receiver

MORE and more hams appear to be discovering that they can build better receivers than they can buy, and for less money. But even if you have no intention of building a complete receiver, you may find a few points of interest in this receiver description. For example, if you have considered making a high-frequency lattice crystal filter for a receiver or sideband exciter, you will find some dope here on building and aligning it, and a circuit with an extra adjustment for extremely flat response in the passband. The h.f. oscillator is a good deal more stable than receiver oscillators usually are. Finally, the product detector has more than 300 times the gain of the double- or triple-triode circuits, and its linearity is at least as good.

Design of the receiver follows Goodman's philosophy¹ of keeping gain low before the "knothole" to reduce overload problems. Plug-in coils cover the amateur bands from 80 through 6 meters. The home-brew crystal filter at 4.5 Mc. gives the maximum usable selectivity for s.s.b. The a.v.c. system is very flat and works on c.w., s.s.b. and a.m. A noise limiter and a sharp c.w. filter are included in the audio circuitry.

Front End

As shown in Fig. 1, the r.f. stage uses a 6AK5, which gave better sensitivity on 6 meters than any other pentode tried. It was even superior to a cascode circuit that was used for a while. The 6AK5 is contact-potential biased to permit grounding its cathode pins directly to chassis as an aid to stability.

The mixer is one section of a 6J6, cathode-biased, driven by the other section as a cathode follower. R.f. and mixer tuning capacitors are ganged and tuned by an "R.F. Peak" control on the panel.

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**Box 319, Tolono, Illinois.

¹ Goodman, "What's Wrong with Our Present Receivers?," *QST*, January, 1957.

This is an "idea" article rather than a blow-by-blow description of construction; nevertheless, there is ample detail for the reasonably-savvy ham who might want to copy it. Besides ideas, the accent is on design and adjustment of the less familiar circuits incorporated in the receiver.

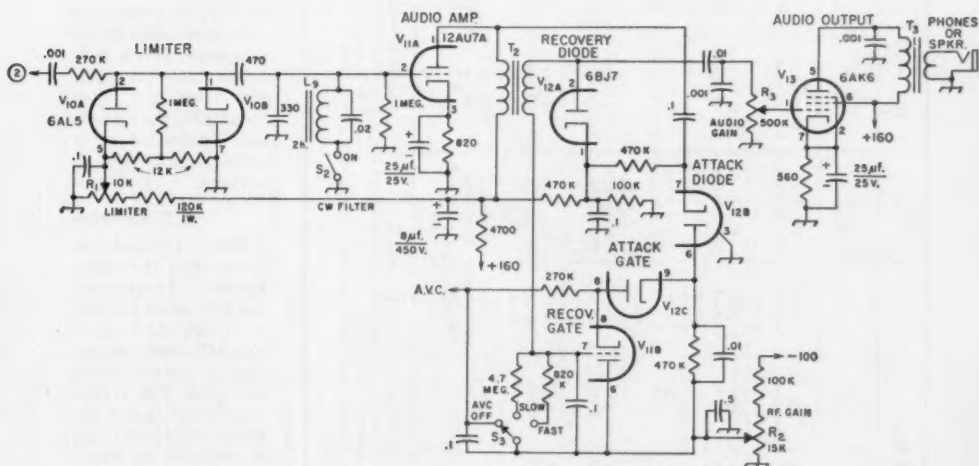
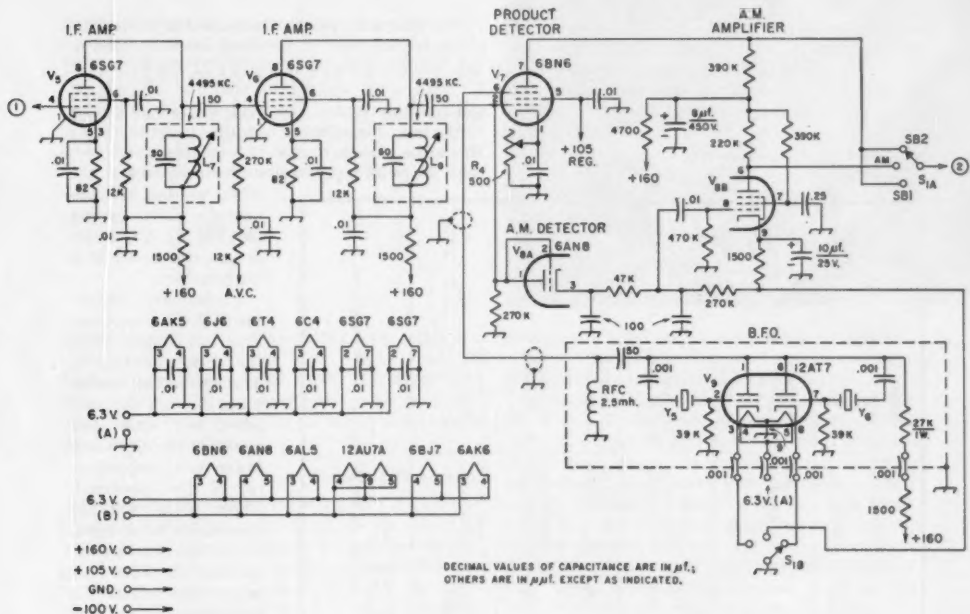
H.F. Oscillator

The art of making oscillators stable has made great strides in the last decade. V.f.o.'s for transmitters are much better than they used to be, largely because the Clapp and Vackar circuits have become popular. Receivers, though, continue to use the ancient and mostly inferior plate-tickler, grid-tickler, and Hartley circuits,² usually with a low g_m tube such as 6C4. This seems strange, because oscillator stability is just as necessary in a receiver as in a transmitter.

This receiver uses the Vackar oscillator,³ which has several advantages over other configurations. Like the Clapp, it is a variation of the Colpitts which steps down the tuned-circuit impedance by a capacitive voltage divider, so that variations in load or in tube capacitances are swamped by the low impedances presented to the tube. A change in heater voltage or plate voltage thus has little effect on frequency. The Vackar, unlike the Clapp, permits the oscillator cathode to be grounded to avoid 60-cycle f.m. caused by heater-cathode capacitance. Its output is more

² It would be perhaps fairer to say that these three circuits are often inferior, in practice, although not necessarily so in theory. It seems quite well established by now that all circuits are capable of equal stability if the same tube and operating parameters are used. However, component characteristics are generally more favorable to realization of optimum operating conditions in the case of the Clapp and Vackar. — Editor.

³ Clapp, "Frequency Stable LC Oscillators." *Proc. IRE*, August, 1954, p. 1295.



spurious resonances for 50 kc. or so above the main response. Vester⁴ outlines one method using a signal generator and the station receiver.

We didn't have a stable enough signal generator, so we haywired together a little three-tube test chassis using the circuit shown in Fig. 3A. The tunable 4.5-Mc. output of the test chassis is fed to the crystal as in Fig. 4 and the v.f.o. adjusted for a peak (at the zero) or a null (at the pole) on the v.t.v.m. Since relative frequency is all we need to know, the v.f.o. is heterodyned

with a crystal oscillator and the resulting audio beat measured by Lissajous figures with a scope and a calibrated audio oscillator, set up as in Fig. 3B.

Four crystals with pole-zero spacings of 1600 cycles or more and a minimum of spurious peaks should be selected for the filter. Set aside two of the remaining crystals for use in the b.f.o. The filter crystals may then be etched⁵ with ammo-

⁵ Newland, "A Safe Method for Etching Crystals," QST, January, 1958.

nium bifluoride solution until two of them have zero frequencies about 1800 cycles above the zeros of the other two. All four crystals should be etched high enough so that the zero of the lower pair is at least a kilocycle above the pole of the lower b.f.o. crystal. The b.f.o. crystals will be etched to exact frequency after the receiver is completed.

The filter may next be assembled in a Minibox of convenient size. In the filter assembly used in this receiver a Plexiglas plate, with holes cut in it for two octal sockets to hold the crystals, is mounted horizontally between the two long sides of the box. The number of turns on the toroid T_1 should be chosen so that it resonates at 4.5 Mc. with 20 to 25 $\mu\text{f.}$ when the two sections of the

bifilar winding are connected series aiding (see Fig. 5). A Q meter or grid-dip meter is a big help here.

Preliminary adjustment of the completed filter box is made using the setup of Fig. 6. Tuning the test chassis v.f.o. through the passband will show two peaks, at the upper and lower ends, respectively, of the passband. These peaks will not necessarily be of equal amplitude. Set the v.f.o. halfway between the peaks and adjust C_{12} for maximum reading on the v.t.v.m. or scope. Don't expect the passband response to be absolutely flat at this stage. It will look better later on when the filter has been mounted in the receiver and terminated in a properly adjusted L network.

I.F. Circuits

The 6C4 cathode follower after the mixer has about the right output impedance to drive the filter, which has a characteristic impedance of approximately 500 ohms. The L network (C_{13} , L_8 and the 68- $\mu\text{f.}$ capacitor) can be adjusted to terminate the filter properly for flat response.

The b.f.o. is crystal-controlled to eliminate the drift problem and ensure that b.f.o. frequency is set correctly with respect to the filter passband. The entire b.f.o., crystals and all, is built in a $3\frac{1}{4} \times 2\frac{1}{2} \times 1\frac{1}{2}$ -inch Minibox, and all power

Oscillator Coil Box						R.F. Coil			Mixer Coil				
Band	L_5	C_5	C_6	C_7	C_8, C_9	L_1 (Note 4)	L_2	Diam.	Length	L_3 (Note 5)	L_4	Diam.	Length
80	31 turns B&W 3007 (Note 1)	100 APC	100 APC	25 zero-temp. ceramic	470 silver mica	5½ turns No. 32 enam.	45¾ turns No. 32 enam.	1¼	1½	16¾ turns No. 32 enam.	45¾ turns No. 32 enam.	1¼	1½
40	22 turns B&W 3007	50 APC	50 APC	25 NPO	470 silver mica	4¾ turns No. 24 enam.	23¾ turns No. 24 enam.	1¼	1½	8¾ turns No. 24 enam.	23¾ turns No. 24 enam.	1¼	1½
20	28 turns B&W 3007	50 APC	50 APC	25 NPO	470 silver mica	3¾ turns No. 24 enam.	11¾ turns No. 24 enam.	1¼	1½	5¾ turns No. 24 enam.	11¾ turns No. 24 enam.	1¼	1½
15	12 turns B&W 3007	50 APC	50 APC	25 NPO	390 silver mica	2¾ turns No. 24 enam.	8¾ turns No. 20 enam.	1¼	1½	4¾ turns No. 24 enam.	8¾ turns No. 20 enam.	1¼	1½
10	10 turns No. 8 bare (Note 2)	50 APC	50 APC	25 NPO	300 silver mica	1¾ turns No. 24 enam.	6¾ turns No. 20 enam.	1¼	1¼	3¾ turns No. 24 enam.	6¾ turns No. 20 enam. (Note 6)	1¼	1¼
6	8 turns No. 8 bare (Note 3)	56 zero-temp. ceramic fixed	50 APC	25 NPO	150 zero-temp. ceramic	tapped 2 turns from ground end of L_2	6 turns No. 18	⅝ (B&W 3006)	⅝ (B&W 3006)	6 turns No. 20 inserted in L_4	6 turns No. 18 (Note 6)	⅝ (B&W 3006)	⅝ (B&W 3006)

¹ B&W 3007 Miniinductor coil stock, ½-inch diam., 16 turns per inch.

² Length 1¼ inches. Self-supporting. Wound on ½-inch diam. form and allowed to spring out to ¾-inch diameter-to-center.

³ Length 1¼ inches. Self-supporting. Wound on ⅝-inch form and allowed to spring out to ¾-inch diam., center-to-center.

⁴ L_1 interwound at cold end of L_2 .

⁵ L_2 interwound at cold end of L_4 .

⁶ 3-30 gsf. trimmers, C_2 across L_4 are omitted in the 10 meter and 6-meter mixer coils.

⁴ L_1 interwound at cold end of L_2 .

⁵ L_3 interwound at cold end of L_4 .

⁶ 3-30 $\mu\text{f.}$ trimmers, C_3 , across L_4 are omitted in the 10 meter and 6-meter mixers.

¹ B&W 3007 Miniductor coil stock, $\frac{5}{8}$ -inch diam., 16 turns per inch.

² Length 1 $\frac{1}{4}$ inches. Self-supporting. Wound on $\frac{1}{4}$ -inch diam. form and allowed to spring out to $\frac{3}{8}$ -inch diam., center-to-center.

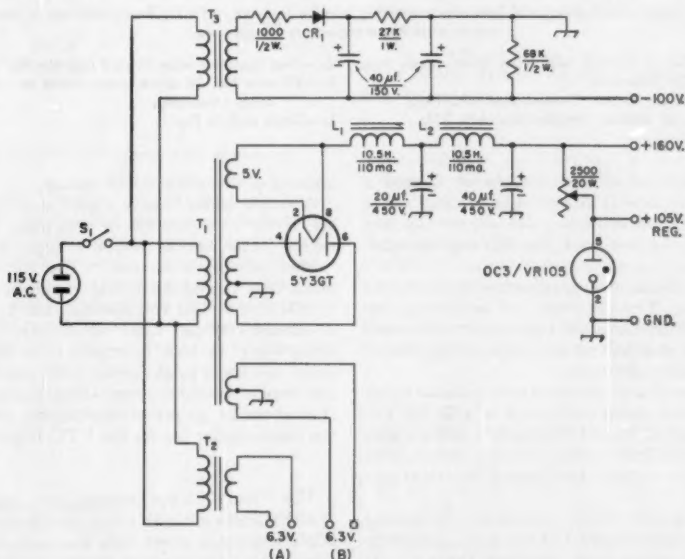
³ Length 1 $\frac{1}{4}$ inches. Self-supporting. Wound on $\frac{3}{8}$ -inch form and allowed to spring out to $\frac{1}{2}$ -inch diam., center-to-center.

peak-to-peak (0.7 volt r.m.s.), while outside this range the tube limits sharply. Grid 3 has similar characteristics except that its gain is lower.

Tests have shown that the linearity of the 6BN6 as a product detector is excellent. At 0.3 volt r.m.s. input to grid 1, the modulation recovered from a 50-percent modulated signal, measured with b.f.o. off, was 40 db. below the normal beat note obtained with the b.f.o. on. At an input of 0.7 volt the distortion products were still 35 db. down. Above 0.7 volt grid 1 was driven into the limiting region and distortion increased rapidly. Signal input in this receiver is 50 to 100 millivolts, well below the limiting threshold.

With 3 or 4 volts of b.f.o. injection on grid 3, the 6BN6 has a conversion gain of 50—that is, 100 millivolts of i.f. signal at grid 1 produces 5 volts of audio at the plate. By contrast, a 12AU7

We believe that the product detector is a significant improvement over many of the circuits which have been published. It uses the 6BN6 gated-beam tube, a type originally developed for service as limiter and phase detector in f.m. receivers. The signal grid of a good product detector must be very linear so that there is no intermodulation among components of the signal. A glance at the 6BN6 curves shows that grid 1 is almost perfectly linear over a range of 2 volts



CR₁—Silicon rectifier, 130 volts r.m.s., 150 ma. (Sarkes-Tarzon M150).
L₁, L₂—10.5 hy., 110 ma. (Stancor C-1001).
S₁—S.p.s.t. toggle.
T₁—Power, 540 volts c.t., 120 ma.; 5 volts, 3 amp.; 6.3

volts, 3.5 amp. (Stancor PC-8405).

T₂—Filament, 6.3 volts, 3 amp. (Thordarson 21F10).

T₃—Power, 117 volts, 20 ma. (Thordarson 26R32);
heater winding not used.

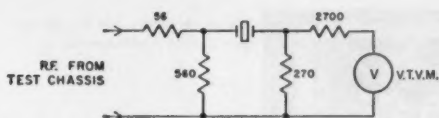


Fig. 4—Isolating network used for measuring crystal pole-zero spacing and spurious resonances. The crystal is plugged into an octal socket and the remaining socket contacts used as tie points for the $\frac{1}{2}$ -watt resistors. Indicator can be a v.t.v.m. with r.f. probe or a wide-band scope.

from operating the a.v.c. A very slight "burst" can be noticed now on the first syllable of a transmission, but it is not bothersome at all. A choice of two recovery time constants is provided. The "fast" position is occasionally useful on rapidly fading signals, but the "slow" position is used most of the time. Delay bias on the attack and recovery diodes (determined by the 470K-100K divider) is set so that the i.f. signal at the detectors is about 50 to 100 millivolts, as already noted.

The principal change from Luick's a.v.c. circuit is the method of applying manual r.f. gain control. The r.f. gain knob controls a variable negative bias which is fed to the a.v.c. line in such a way that it controls receiver gain and at the same time acts as additional delay bias on the

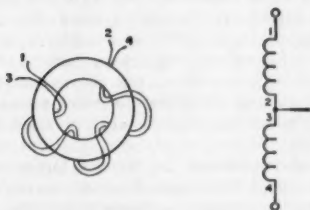


Fig. 5—Series-aiding connection of toroid T_1 .

a.v.c. diodes. Thus the r.f. gain knob can be set to prevent background signals and noise from booming in during pauses, while full a.v.c. remains available to handle normal fading.

Shunt capacitors in the audio circuits are chosen so that high-frequency response drops off above 2500 cycles to reduce fatigue from high-pitched hiss. Low frequencies are cut below 300

cycles to restore balance on voice signals. The resulting audio quality is crisp and intelligible.

Construction

The receiver is built on a $12 \times 17 \times 3$ -inch aluminum chassis with an $8\frac{3}{4}$ -inch aluminum rack panel. The top-view photo shows the layout.

The oscillator tuning capacitor, C_{10} , is driven by a National NPW-0 dial and gear unit, through an insulated coupling. The capacitor is mounted on a $\frac{1}{8}$ -inch sheet of mica-filled bakelite, and its mounting feet are bolted to an aluminum L-bracket which is fastened to the bakelite sheet. This arrangement provides two-point support to prevent the stator from twisting. The bakelite sheet is held away from the gear box by three metal spacers and 12-24 threaded rods. The only electrical ground on the rotor of C_{10} is a heavy wire lead passing through a hole in the chassis and connected to a solder lug on the underside. Thus the circulating current through C_{10} has a single definite path so it can't wander all over the chassis looking for a route to the under surface.

The oscillator coil and associated capacitors for each band are assembled in a $4 \times 2\frac{1}{4} \times 2\frac{1}{4}$ -inch Minibox (see close-up photo). A piece of mica-filled bakelite in the bottom of the box supports a row of four banana plugs which project through a rectangular cutout in the $4 \times 2\frac{1}{4}$ -inch surface of the box section. A fifth banana plug grounds the shield box to the chassis.

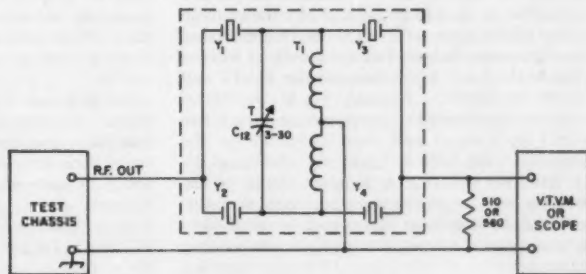
A small copper shield is soldered across the 6BN6 socket to isolate the signal grid (pin 2) from the b.f.o. injection grid (pin 6). All power wiring is done with shielded wire to eliminate one source of feedback.

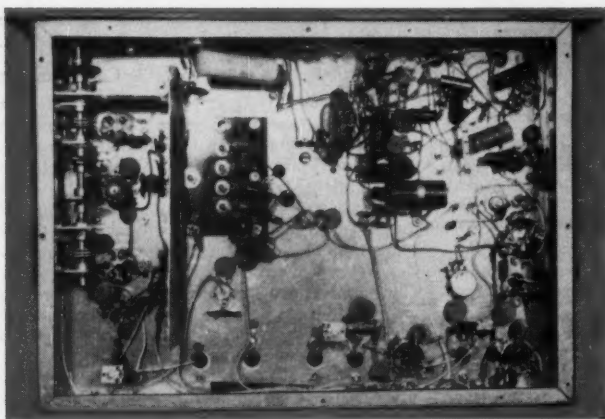
The power supply is built on a separate $5 \times 10 \times 3$ -inch chassis. Its schematic is shown in Fig. 2.

Alignment

Alignment of the front end is easy, since the receiver is not gang-tuned. The i.f. stages and the L network terminating the crystal filter can be aligned with the aid of the test chassis of Fig. 3. Pull out the 6AK5 and wrap a wire from the test chassis r.f. output around the mixer coil. Set the sideband switch to the a.m. position, a.v.c. off, and connect a d.c. v.t.v.m. or high-resistance voltmeter across the 270K load resistor in the cathode of V_{8A} . Pull out the 6BN6 to avoid load-

Fig. 6—Setup for preliminary adjustment of C_{12} . Indicator can be a v.t.v.m. with r.f. probe or a wide-band scope.





The r.f.-section tuning capacitors are along the left-hand edge of the chassis in this view of the bottom. Leads to the crystal filter go through the holes along the lower center edge of the chassis.

ing by its grid current. Tune the test chassis v.f.o. within the filter passband, set C_{13} near maximum capacitance, and peak L_6 , L_7 and L_8 . Now tune the v.f.o. carefully through the passband and observe the flatness of the filter response. Adjust C_{13} to a slightly different value and repeak L_8 . Repeat this process until the passband response is as flat as possible. Set the v.f.o. to the exact center of the passband and recheck C_{12} for maximum signal. The filter response should be flat within about 5 per cent. Reinsert the 6BN6 and repeak L_8 with the r.f. gain control set to give the smallest observable deflection on the voltmeter.

When the filter alignment is complete, the b.f.o. crystals may be etched to frequency. Set the test chassis v.f.o. about 10 db. down one skirt of the filter response curve (voltage one-third of maximum). Etch the b.f.o. crystal until it is in zero-beat with the v.f.o. Do the same thing with the other b.f.o. crystal on the other filter skirt.

To check for spurious filter responses, restore the receiver to normal operation and tune in a strong modulated signal on a dead band, such as 10 meters in the evening. Tune the main dial through about 50 kc., tuning above the signal on 80 or 40 or below the signal on 20, 15, 10 or 6. Listen carefully to see if the signal appears at another dial setting. If so, the spurious response can sometimes be reduced by interchanging Y_1 and Y_4 . It is then necessary to readjust C_{12} .

The product detector is adjusted for best linearity by tuning in a modulated signal and setting the r.f. gain to give about 15 volts of audio at the 6BN6 plate with b.f.o. on. A modulated signal generator is best, but a voice signal will do. Disable the b.f.o. by pulling out the 12AT7 and adjust the 500-ohm resistor, R_4 , in the 6BN6 cathode for minimum recovered audio. There should be a sharp null near mid-range on the resistor. If the null is broad try changing the r.f. gain till you find a definite setting of the 500-ohm resistor where the signal almost disappears. A setting near maximum or near zero resistance is not correct; the tube is in the limiting region here.

Toroids

The only unusual item in the parts list is the ferrite toroid T_1 . A readily-available source of toroids, suggested by Brian Voth, W9ARZ, is the hollow ferrite core of a b.c. set antenna made by Grayburne and sold under the name Superex Ferri-Loopstick, net price 44 cents. A machinist who owns a small diamond cutting wheel can slice off a few toroids for you. It is also possible, with a little luck, to break the ferrite like a piece of glass tubing after filing a notch in it. The break may require smoothing with a file or grinder. No. 34 or 36 enamel wire is about right for the winding. The Ferri-Loopstick toroid takes about 9 bifilar turns to resonate with the 3-30- μ f. trimmer.

Apparently almost any kind of ferrite will do for the toroid. The transformer is connected at a low-impedance point, so losses have little effect. Some rather high-loss material has been used experimentally with good results.

Results and Second Thoughts

The completed receiver has proved very satisfying to operate on the crowded bands. A.v.c. is remarkably flat and works equally well on sideband, a.m. or c.w. Noise figure has not been measured, but it appears to be as low as necessary even on 6 meters.

The crystal filter performs well as it is, but a possible project for the future is to add two more half-lattice sections to make it an 8-crystal filter. Skirts would be steeper, final attenuation increased, and spurious responses knocked down further.

Another idea that may be tried sometime is to replace the tuned mixer grid coils with plug-in bandpass couplers. The r.f. peaking control could then tune the input circuit to exact resonance in spite of any detuning by antenna reactance.

It is possible that a strong signal on the 4.5-Mc. i.f. might get through the front end on 80 meters. A parallel-tuned trap in series with

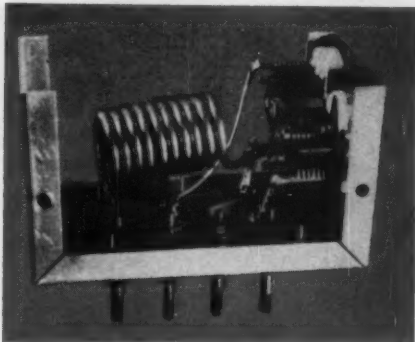
Interior of the 10-meter oscillator coil box. Layout of components in the other coil boxes is similar.

the antenna lead should take care of it. The bottom plate of perforated aluminum helps to prevent direct pickup of signals in the i.f. wiring.

The design of this receiver was a joint project between the authors, but W9BIY did all the construction, and the set belongs to him. Any questions about details of construction or performance should be addressed to W9BIY.

We wish to thank Jim Fisk, W9GRQ, for taking the photographs and for his many helpful comments on the article.

QST



• New Apparatus

Mobilier Safety-Mike

MOBILE operating with both hands on the wheel is possible when the Mobilier Safety-Mike shown in the photograph is used. Designed to enhance mobile operating safety, the device is made from stainless-steel wire which has been coated with a tough layer of gray plastic material. The headgear can be sprung and formed by hand to fit the wearer's head. The model shown in the photograph also contains a "flexi-mount" attachment which allows the wire cage microphone support to be moved and locked vertically or laterally to fit the wearer. Models fitted with crystal, carbon or controlled-reluctance cartridges are available, and an earphone attachment can be obtained if desired. Using the Safety-Mike in conjunction with voice-operated break-in, or with a foot switch which is also available from the manufacturer, will still further insure safe and pleasant mobile operation. The Safety-Mike weighs only a few ounces. It is manufactured by the Mobiliers, 722 Main, Coshocton, Ohio.

— E. L. C.



Strays

Last September W4FKJ was tuning toward the 160-meter band from WWV on 2.5 Mc. when, on about 2.2 Mc. he heard someone frantically calling the Coast Guard and saying that he was sinking. The Coast Guard station in New Orleans answered but reported that the signal from the sinking vessel was too weak to copy the message. W4FKJ got right on the telephone and called the Coast Guard station in New Orleans, reporting the name of the sinking vessel and its announced location. The net result was that all personnel aboard the vessel were saved, and W4FKJ received a nice letter of thanks from the Coast Guard.

K4RBO, a teacher at the Gibsonville (N. C.) high school, brought his ham rig to school to demonstrate to his pupils. Unfortunately, when he fired up with a lusty CQ on 10 meters, he got into a tape recorder that was being used with puppets for a production of "MacBeth" in the auditorium, and broke up the performance.

— —
JA1BIG is six foot three — KN3IJP/KA2 adds: "As you know, 6' 3" is tall for a man in the U.S. but for a Japanese that is a monster. JA1BIG says that people are always coming up and standing by him — they just look up at him and stare. His XYL is 4' 1"!"



The unit mounted on the front panel of the 2-meter rig at W2BLO. The crystals plug into a dual crystal socket.

The little unit described here by W2BLO is the missing link that will tie your 80-meter v.f.o. to your rock-bound 144-Mc. rig. It requires only one or two surplus crystals.

Simple Converter Unit with 24-Mc. Output

Using the 80-Meter V.F.O. on 2

BY ELWYN A. GUEST,* W2BLO

THERE are undoubtedly numerous hams operating on 144 Mc. using the conventional exciter lineup consisting of an 8-Mc. crystal, 12AT7 third-overtone crystal oscillator-tripler, and 5763 doubler, or the like. Many of these same hams have reasonably stable basic v.f.o.'s on 3.5 Mc. which they use on the so-called "d.c." bands. The presence of this latter unit, with the advantages of v.f.o. operation, which are apparent even on 144 Mc., and the simplicity and low cost of putting it to use with the little unit described herewith, make it unnecessary to be without such a useful adjunct.

At this writing, the author has just finished a year and a half of 144-Mc. operation with the aforementioned conventional crystal-controlled lineup. He has considered himself fortunate to be able to jump about the band rather freely with a bank of six crystals and a switching arrangement with an equal number of settings, to say nothing of a few spare rocks which could be substituted in one of the receptacles if desired. There were times, however, when contacts were missed, or during contests and band openings, when the 80-meter exciter with its v.f.o. got more than a casual glance. Although the v.f.o. stability was such that we might have considered a simple multiplier to put it to use, its tuning range barely covered the 3.5-4-Mc. band, and therefore its harmonics would not hit the 144-Mc. band. Thus, its real possibilities did not occur to us for many months.

The Solution

Then, a few weeks ago, our friend Fred Winters,

* Angola, New York.

W2PZF, was visiting in our shack when the conversation hit upon the subject of the v.f.o. and how nice it would be to use it on 144. At his suggestion, we got out paper and pencils and a crystal catalog (Texas Crystals) and began to make calculations based on a heterodyne system. We finally hit upon two low-cost surplus crystals which would give us what we needed to cover the 144-Mc. band. When operated in a third-overtone oscillator circuit, stock crystals of 6825 kc. and 6900 kc. oscillate on 20.475 Mc. and 20.7 Mc., respectively. When mixed with the 3.5-4-Mc. signal from the v.f.o. unit, these signals add up to the 24-Mc. frequencies desired.

Using the capacitive feedback type of overtone oscillator in our 144-Mc. rig, and crystal switching, as we do, we were able to devise a simple method of switching the mixer output into one of the crystal sockets and at the same time provide for neutralization of the former crystal oscillator. The latter is a necessity because the oscillator operates as a straight-through amplifier on 24 Mc. (see Fig. 1). With the crystal switch in the other position (or, actually, in one of five other positions in our case), the stage is still used as a crystal oscillator when desired.

The Converter

The mixer-oscillator is of conventional design, utilizing a 12AT7. The oscillator is a capacitive-feedback overtone type and requires a single-pole double-throw rotary switch for switching the two crystals. A TV width control proved to be a convenient unit for the 3.5-Mc. slug-tuned circuit. We removed turns down to one close-wound layer and shunted it with a 50- μ f. ceramic fixed

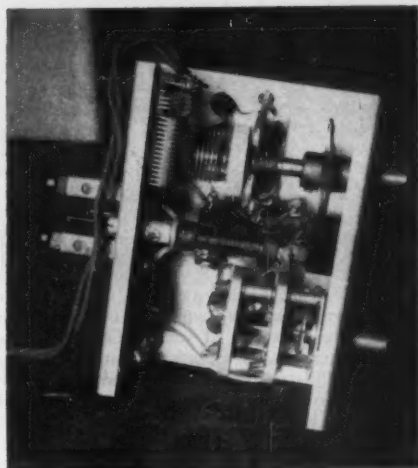
A bottom view of the mixer-oscillator unit. The modified TV width control, used for the 80-meter tuned circuit, is in the center, foreground, while the slug-tuned oscillator coil can be seen just behind it. The link from the v.f.o. unit is connected to the binding posts at the left. At the top is the 24-Mc. tuned circuit and link, while the crystal switch is at the bottom. A toggle switch is in series with the B-plus lead so that the unit may be switched off separately if it is desired to operate the rig crystal-controlled.

capacitor. The coupling to be used between this coil and the v.f.o. link depends upon the output power of the v.f.o. We had to couple ours very loosely because our v.f.o. exciter unit has a 6L6 doubler for the output stage, which can easily overdrive the mixer grid.

The entire unit was constructed on a $4\frac{1}{2} \times 3\frac{1}{4} \times 2$ -inch aluminum chassis. Power to operate it is taken from the main rig through a three-wire cable. A toggle switch in the B-plus lead provides for switching the mixer-oscillator off when the rig is crystal-controlled.

Other Systems

Admittedly, the heterodyne method could be utilized to give a mixer output frequency of 8 or 12 Mc. and would require only one crystal to cover the entire band. This would have the additional advantage that its output could be fed as a crystal substitute into the oscillator, which would then act as a tripler or doubler and would require no neutralization. However, we preferred the 24-Mc. arrangement, not only on the theory that there would be less likelihood of TVI, but



also because it results in a drift ratio between the v.f.o. and the 144-Mc. band of 1 to 6, as compared to 1 to 18 or 1 to 12 with the other systems.¹

Of course, the 6825-kc. crystal alone would be sufficient for anyone who has no reason to operate above 146.85 Mc. However, we not only

¹ All heterodyne systems produce spurious beats, some of which may reach the transmitter output at substantial level. The output of any transmitter using such a system should be checked carefully as mentioned later in the article. —Ed.

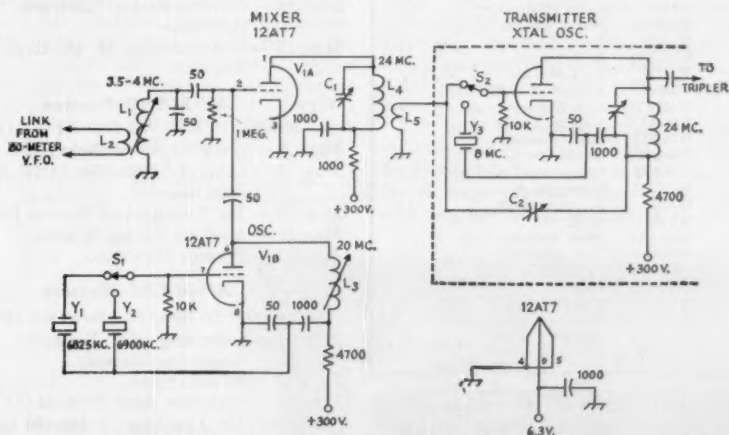


Fig. 1—Conversion circuit for obtaining 24-Mc. output with 3.5-Mc. input. Capacitances are in μf . Bypass capacitors are disk ceramic; other fixed capacitors should be NPO ceramic or mica. Resistors are $\frac{1}{2}$ watt and resistances are in ohms.

C₁—25- μf . miniature variable (Bud LC1-642 or equivalent).

C₂—30- μf . mica trimmer.

L₁—50 turns No. 26 enam. on $\frac{1}{4}$ -inch iron-slug form (Stancor WC-1 TV width control with turns removed leaving single layer, full length, approx. 40 μh).

L₂—Single turn of hookup wire loosely coupled to ground end of L₁.

L₃—12 turns No. 32, 3/16 inch long on $\frac{3}{8}$ -inch iron-slug form, approx. 5 μh .

L₄—15 turns No. 20, $\frac{3}{8}$ -inch diam. 1 inch long (B & W 3007 Miniductor, approx. 1.8 μh).

L₅—2- or 3-turn link at ground end of L₄ (same coil stock as for L₄ may be used).

S₁, S₂—S.p.d.t. rotary.

Y₁, Y₂, Y₃—See text.

operate in a RACES net on 147.24 Mc., but also like to use the upper portion of the band for local ragchews. The 6900-ke. crystal gives a big overlap and covers the rest of the band very nicely.

Calibration

Since the third overtone of a crystal will not necessarily be an exact multiple of the fundamental frequency, it is important to check the oscillator frequency in the 20-Mc. range, or the mixer output frequency in the 24-Mc. range, before setting up a 144-Mc. calibration chart based on the v.f.o. calibration. If a frequency meter for these frequencies is not available, checks may be made against known frequencies in the 144-Mc. band, making sure that you are listening to the right signal, since harmonics of various frequencies resulting from the mixing process are likely to be heard, almost as loud as the fundamental, in the receiver.

Once the oscillator frequency is known and the calibration definitely established, a 144-Mc.

calibration chart may be drawn up, and it is suggested that this include receiver settings. At W2BLO we show the frequency and the v.f.o. dial setting for each dial division on the receiver. This is handy and almost necessary if one wishes to be able to "zero in" quickly to a particular spot on the receiver dial, since the harmonics mentioned in the paragraph above can cause some confusion if one tries to do it entirely by ear.

Spurious Output

One disadvantage of the heterodyne method of frequency conversion is that spurious frequencies are generated which may get through to the final amplifier or antenna. Recognizing this fact, several checks were made both with a g.d.o. and with the assistance of local amateurs with sensitive receiving systems. All checks showed that spurious signals were negligible so long as the coupling between the v.f.o. and the 80-meter coil in the mixer was adjusted to the minimum required for adequate drive. QST

Strays

HAMS AT HEADQUARTERS W1AW, ARRL Headquarters Station

The following list shows the present calls and names of the Headquarters gang:

W1BDI	F. E. Handy
W1BUD	A. L. Budlong
W1CUT	E. Laird Campbell
W1DIF	George Grammer
W1DGL	John Lindholm
W1DX	Byron Goodman
W1HDQ	E. P. Tilton
W1HCP	L. G. McCoy
W1IKE	Richard L. Baldwin
W1JMY	J. A. Moskey
K1LBJ	Kingsley Locke
W1LVQ	John Huntoon
KN1LYO	Gordon Davis
K1LVW	George Stevens
W1NJM	George Hart
W1QIS	Murray Powell
W1TS	D. H. Mix
W1UED	Perry Williams
W1VG	L. A. Morrow
W1WPO	R. L. White
W1WPR	C. R. Bender
W1YYM	Ellen White
W1ZIF	Kenneth Lamson
W1ZIM	Miriam Knapp
W1ZJE	Lillian M. Salter



Here are the May schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings, 2100 EST, 4030 ke, upper sideband)
May 4 — Antenna Panel.
May 11 — Frequency Control.
May 18 — Communication Electronic Needs of the Future.
May 25 — Fundamentals of Oscillator Operation.

AF-MARS Eastern

(Sunday 1400 EST: 3295, 7540 and 15,715 ke.)
May 1 — Quality Control Techniques.
May 8 — Medical Electronics in Gastro-intestinal Research.
May 15 — The Evolution of Modern Radar.
May 22 — Air Crew Escape Systems.
May 29 — Modern Materials.

AF-MARS Western

(Sunday 1400 EST, 7832.5 ke., 3295 ke, and 143.46 Mc.)
May 1 — Increasing the Versatility of the Simple Oscilloscope.
May 8 — Steps in Space.
May 15 — Operation Alert 1960, of O.C.D.M.
May 22 — The Challenge of Inertial Guidance.
May 29 — Technical Net Session.

How many of you have plowed through the Course in *Radio Fundamentals* published by the League, designed to be studied in conjunction with the *Handbook*? K6TER did, and here he is pictured with the manuals and the experimental gear that he built during his study. Incidentally, we have just published new editions of both the Course and the *Handbook*. Anyone who works his way through the Course will have a good basic knowledge of radio.

The panel is 10½ inches high and of standard 19-inch rack width. The pi-network coil switch is between the tank-capacitor and loading-capacitor controls. Across the lower portion of the panel, from left to right, are screen meter, a.c. power switch, grid meter, S_5 (above) and S_2 , and the cathode-current meter.



“Der Loudenboomer”

High-Power Grounded-Grid AB₁ Linear for Multiband S.S.B.

BY LEE BERGREN,* WØAIW
AND W. T. BISHOP,* WØUI

This grounded-grid linear with built-in filament, bias and screen supplies is capable of handling maximum legal s.s.b. input. Of more than ordinary interest are the control and protective circuits which make the amplifier virtually blow-up proof.

WHAT price high power? Well, actually not too much when it is made a community project.

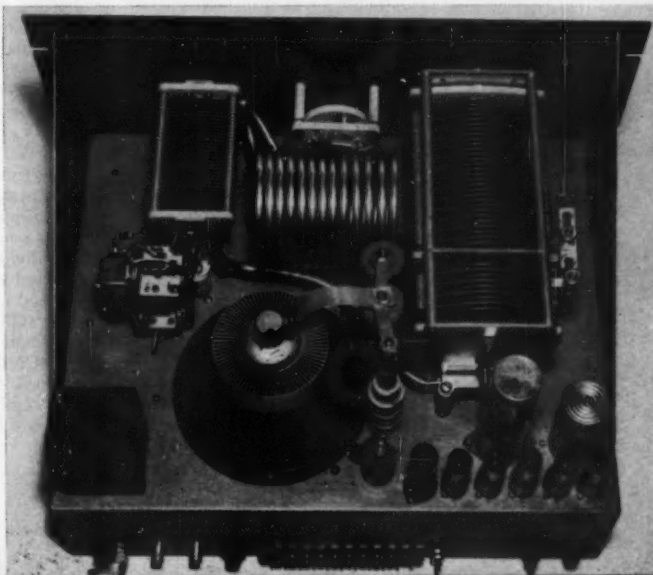
A few months ago, WØRPE suggested that the spare-time manufacturing facilities of Radio Industries, Inc., and the procurement facilities of several of the local hams be united for the purpose of constructing a group of s.s.b. linear amplifiers at nominal cost to each of the participants. A quick meeting of WØUI, WØAIW, WØHRC, WØLVA, WØMMB, WØRPE and WØUQV was called and thus “Der Loudenboomer” project was born.

* Radio Industries, Inc., 1307 Central Ave., Kansas City 2, Kansas.

Several evenings were spent kicking ideas around. The good ones were sifted out and these, together with some unique features from current commercial s.s.b. transmitters, finally froze the design. The schematic gradually took form, and the fabrication of seven sets of parts was under way. Evening operation of punch presses, lathes and welding equipment by the seven pencil jockeys was successfully concluded with loss of neither hand nor limb.

The story of these amplifiers is written not so much with the idea that they will be closely duplicated, but more with the hope that they will furnish some suggestions that may be combined with the individual imagination in the design

A standard 17 × 13 × 4-inch chassis provides adequate space for the amplifier. The antenna relay is to the rear of the pi-network loading capacitor at the left. Behind the dual tank capacitor at the right are filter capacitors, voltage-regulator tubes and the thermal time-delay switch. The screen-supply filter choke is in the rear left-hand corner. The strap (S_1) which connects the two stators of the tank capacitor for operation on the lower frequencies may be seen at the lower right of the capacitor.



May 1960

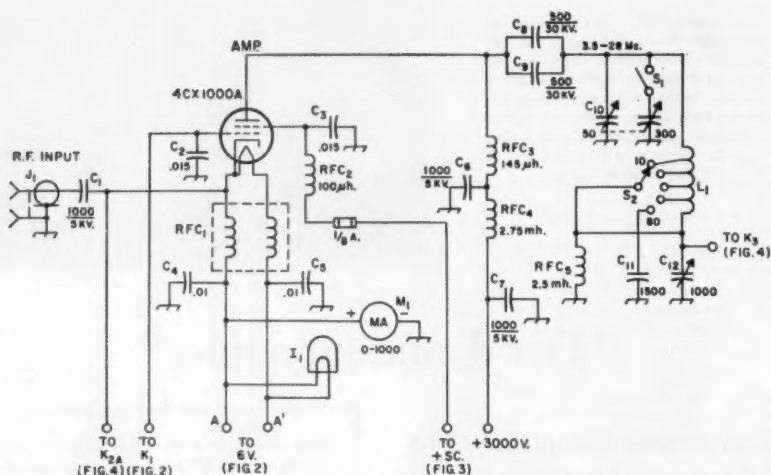


Fig. 1—Circuit of the 4CX1000A grounded-grid amplifier. Capacitances less than .01 μ f. are in μ f.

- C_1, C_6, C_7 —Ceramic (CRL 858S-1000).
 C_2, C_3 —Three 5000- μ f. 600-volt disk ceramics in parallel.
 C_4, C_5 —500-volt mica.
 C_8, C_9 —Ceramic TV capacitor.
 C_{10} —Special dual capacitor; see text.
 C_{11} —Three 500- μ f. 10,000-volt "Glassmike" capacitors in parallel (Condenser Products LSG501-1OM).
 C_{12} —2000-volt variable (Johnson 1000E20).
 I_1 —6-volt dial lamp.
 J_1 —Chassis-mounting coaxial receptacle (UG-290/U).
 L_1 —13 turns $\frac{1}{4}$ -inch copper tubing 5 inches long, 3 inches

in diameter, tapped at approximately 6 turns, 4 turns, 3 turns and 2 turns. (Adjust to resonate with C_{10} set at 330, 150, 70, 40 and 25 μ f. respectively for the bands 3.5 through 28 Mc.)

- M_1 —2 $\frac{1}{2}$ -inch d.c. milliammeter (Marion).
 RFC_1 —Bifilar filament choke (B & W FC-15).
 RFC_2 —125-ma. r.f. choke (Miller 4642).
 RFC_3 —Plate r.f. choke (National R-175-A).
 RFC_4 —1-ampere r.f. choke (Miller 7868).
 RFC_5 —125-ma. r.f. choke.
 S_1 —Strap connector on C_{10} (see top-view photograph).
 S_2 —Heavy-duty 25-amp. ceramic single-pole 5-position rotary (surplus).

of any high-power AB₁ linear. To each his own, since no two hams have the same requirements or desires.

R.F. Circuit

Basically, the amplifier was designed around the Eimac 4CX1000A tube, and was to be driven by any of the 100-watt s.s.b. exciters currently available. To make the most efficient use of these exciters, a grounded-grid circuit configuration was indicated.

The complete circuit diagram is shown in four sections for the sake of clarity. Fig. 1 shows the r.f. circuit. It is a quite conventional arrangement for grounded-grid operation and has a pi-network output circuit covering all bands from 3.5 to 28 Mc. with a tapped coil. The tank capacitor is a special dual unit made by Johnson. One section has a maximum capacitance of 50 μ f. while the maximum of the other section is 300 μ f. The 50- μ f. section alone is used for 14, 21 and 28 Mc. A strap connects the 300- μ f. unit in parallel for the two lower-frequency bands. This arrangement reduces the tank-capacitor minimum on the higher-frequency bands where stray capacitances make it difficult to hold the tank Q

down to a reasonable value. A single-section vacuum variable could be used instead of the dual unit, since capacitors of this type have low minimums. On 80 meters, the output capacitance is brought up to the required value by switching in a 1500- μ f. fixed capacitor in parallel with the variable loading capacitor C_{12} .

The bifilar choke RFC_1 provides the necessary r.f. isolation between filament and ground. The milliammeter M_1 reads cathode current. The screen is protected by a $\frac{1}{8}$ -ampere fuse.

Bias Supply

Fig. 2 shows the bias supply. For the sake of compactness, semiconductors are used as rectifiers in a full-wave bridge configuration. An OB2 provides a constant-voltage source across which a voltage divider permits adjustment of bias to give the desired idling plate current. The transformer is a special job which includes a filament winding for the 4CX1000A. If space permits, individual transformers may be substituted, of course.

The 4CX1000A has a grid dissipation rating of zero watts, so any flow of grid current must be guarded against. This function is performed by K_1 which will trip at a grid current of 3 ma. Op-

Fig. 2—Bias supply for the grounded-grid amplifier. K_1 is a safety device which trips if grid current flows. The milliammeter may be switched by S_3 to read amplifier r.f. output voltage.

C_{13} —Two 200- μ f. electrolytic units in parallel.

CR_1, CR_2, CR_3, CR_4 —Silicon diode (1N540 Texas Instruments).

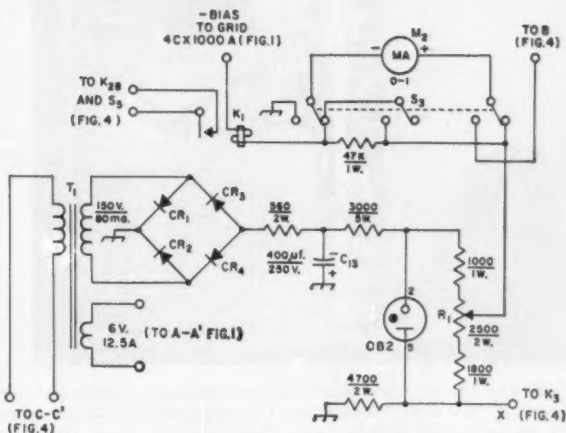
K_1 —5000-ohm 5-mw. sensitive relay (Sigma type 5F-400S).

M_2 —2½-inch d.c. milliammeter (Marion).

R_1 —Bias-control potentiometer.

S_3 —Three-pole double-throw rotary, lever or push-button type with spring return to normal position shown (CRL 1457).

T_1 —Power transformer: 150 volts, 80 ma.; 6 volts 12.5 amp. (Special). Individual transformers may be substituted.



eration of this relay serves to trip relay K_2 in Fig. 4 which, in turn, cuts off plate and screen voltages and shorts r.f. drive to the amplifier. The meter M_2 serves only as an indicator for adjustment of drive just below the grid-current point. S_3 has a spring return which holds the switch in the normal position shown. The momentary-contact position shifts the meter to read rectified r.f. voltage at the output of the amplifier while it is being adjusted for maximum output.

Screen Supply

A regulated screen supply is shown in Fig. 3. Here again semiconductors are used to conserve space. The four series-parallel connected OA2 regulators will handle a variation of 50 ma. or more. However, analysis of the screen-current pulse indicates that the ratio of maximum instantaneous current to the d.c. value is approximately 5 to 1, which means a peak screen current of about 250 ma. Regulation at these peaks is provided by the storage capability of the 40- μ f. output capacitor in the supply filter. The com-

bination of resistor network between the pairs of VR tubes and the tap back to supply voltage is a measure that will assure reliable parallel operation.

To keep the screen-current meter at ground potential, it is connected in series with the regulator tubes, rather than in the positive d.c. lead to the screen. In this position it indicates VR-tube current rather than actual screen current. With the amplifier in the stand-by condition, the meter reads about 60 ma. When the amplifier is driven, screen current is indicated by excursions of the meter pointer toward zero. If the reading falls to zero, it indicates that regulation is lost and that the screen current is above normal.

The primary of T_2 is connected in parallel with the primary of the plate transformer so as to be controlled simultaneously with it.

Control and Protective Circuits

Fig. 4 shows the control and protective-circuit wiring. All power is controlled primarily by S_7 ,

Fig. 3—Regulated screen supply for the "Loudenboomer."

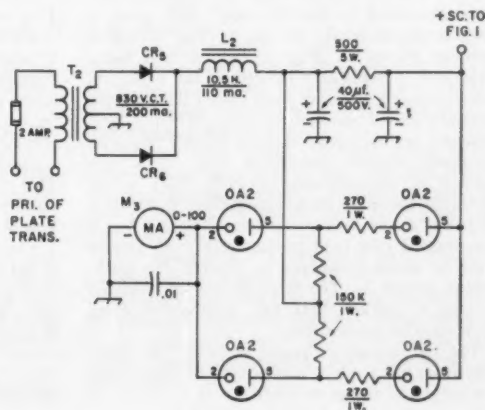
CR_5, CR_6 —Each has four 1N540 (Texas Instruments) silicon diodes in series.

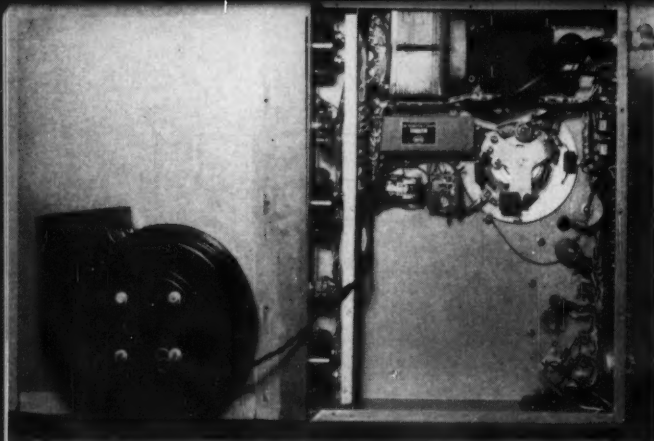
L_2 —Filter choke (Stancor C1001).

M_3 —2½-inch d.c. milliammeter (Marion).

T_2 —830 volts, c.t., 200 ma. (Stancor PC-8301).

Electrolytic capacitors are each two 20- μ f. units in parallel.





In mounting components on the under side of the chassis, space is provided for the blower attached to the bottom cover. The filament choke and protective relays K_1 and K_2 are to the left of the tube socket. The two power transformers are at the top in this view. A baffle strip shields the meters.

which also controls operation of the tube-cooling blower B_1 . However, filament and bias voltages will not be applied until S_6 closes. This switch is operated by a paddle inserted in the air stream of the blower to assure that filament and bias voltages will not be applied without the blower in operation. One of the quickest ways to damage the 4CX1000A is to apply plate and screen voltages before the cathode has reached normal operating temperature. For this reason, the control circuit is so arranged that plate and screen voltages cannot be applied until after the 3-minute time-delay switch S_4 has closed.

From this point on, control is through the VOX relay contacts which actuate the change-over relay K_3 . In the normal position of K_3 , the antenna is connected to the receiver and the auxiliary contacts are open. The grid bias under this condition is approximately 100 volts, which reduces the screen and plate currents to low values on stand-by. When K_3 is actuated by the VOX relay, point X in Fig. 2 is grounded through the auxiliary contacts of K_3 , which brings the biasing voltage to the normal operating value of -60 when R_1 (Fig. 2) is properly adjusted.

K_2 is a locking relay with mechanical latching and electrical reset. On K_{2A} , one normally-closed contact and one normally-open contact of the d.p.d.t. complement are used. On K_{2B} , only one normally-closed contact is used. The relay is latched mechanically in the normal operating position shown in Fig. 4, neither coil being energized. The primary circuits of the plate and screen transformers are held closed through the normally-closed contact of S_{2A} . When a grid overload occurs (approximately 3 ma.), K_1 (Fig. 2) closes, thereby energizing K_{2A} . K_2 is now latched in the opposite position. This action performs three functions: excitation is shorted, plate and screen voltages are removed and K_{2A} is deenergized (but held mechanically). K_2 can be reset to normal position by closing the push-button switch S_5 . The relay should be mounted in such a position that the excitation-shortening leads may be made short.

The r.f. output voltmeter rectifier CR_7 operates from a tap on a capacitive divider across the output of the pi network.

Essential constructional details are covered by the photographs and their captions. Some advance thought should be devoted to the distribution of components on the under side of the chassis so as to leave adequate space for the blower. C_2 and C_3 each consist of three units in parallel, one unit in each case being connected to one of the three "ears" on the fin terminals. The open-type antenna relay is mounted directly at the output terminals of the pi network so as not to introduce any change in s.w.r. on any part of the line. The r.f. voltmeter diode and associated components are mounted in a shielding box alongside the relay.

Adjustment

Fifty watts will drive the tube to the point of grid-current flow. The average cathode driving impedance is in the order of 40 ohms. But this does not mean that a 50-ohm coaxial cable will automatically be properly terminated by the amplifier. The impedance varies widely with excitation and loading. For this reason, keep the cable connection to the driver as short as possible.

A grounded-grid Class AB₁ linear must be adjusted somewhat differently than the usual Class C amplifier and with the 4CX1000A special care must be exercised to prevent exceeding the control-grid and screen-grid dissipation ratings. The reader is referred to the single-sideband chapter of the ARRL *Handbook*, 1960 edition, for information on checking the operation of linear amplifiers. The bias should be adjusted for an idling current of 200 to 250 ma. The drive should be maintained at a level just below the grid-current point. Under some operating conditions, a small reverse grid current may be indicated. This is a result of secondary emission but it is of no consequence since it does not impair the operation of the tube.

The simplest way to arrive at proper loading is to set up on single-tone (c.w.) and resonate the plate tank by tuning for a peak in screen current, and then loading for a screen-meter reading of approximately 30 ma. Approximate output-capacitor values for a 50-ohm load are 2000, 1000, 500, 330 and 250 μ f. for the respective bands 80 through 10 meters.

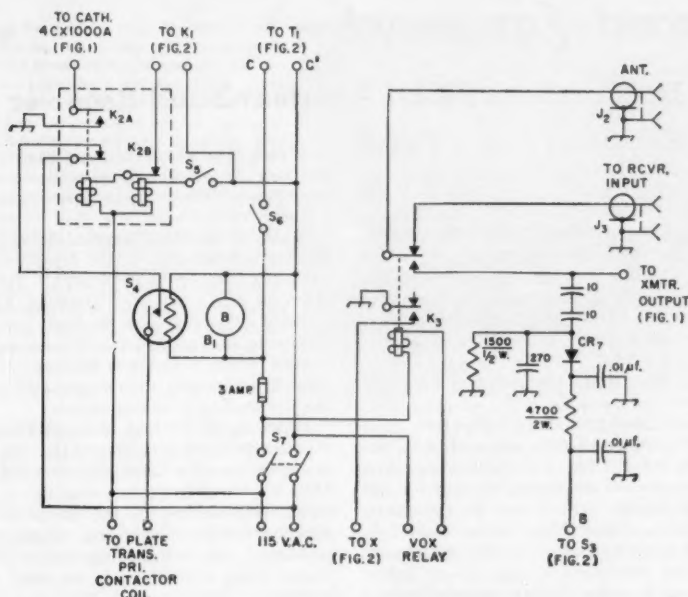


Fig. 4—Control and protective circuits of the 4CX1000A amplifier. Capacitors of 0.01 μ f. are disk ceramic; others are stable ceramic or mica. Capacitances are in μ f. unless indicated otherwise. Resistances are in ohms.

B₁—Blower (W. W. Grainger 2CD67).

CR₇—1N34 crystal diode.

J₂, J₃—Chassis-mounting coaxial receptacle (SO-239).

K₂—Electrical-reset locking relay, 115-v. a.c. coils, d.p.d.t. contacts each section (Guardian 1R-1200-1200-115GG). See text for explanation.

K₃—Antenna change-over relay (Leach 1177CBF).

S₁—Thermal delay switch (GV Controls Inc. * R-F160).

S₂—Push-button switch, normally open.

S₃—S.p.s.t. normally open switch with paddle attached to operate from blower air stream (Acro TD-481 or similar).

* Oker Parkway, Livingston, N. J.

"Der Loudenboomer" has turned out to be a real flame thrower. It has operated smoothly without the need for any form of parasitic suppression. At least part of the credit for this should go to the excellence of tube design, although the short, heavy leads in the r.f. plate-to-

cathode path also contribute to the stability at v.h.f. Based on the ratio of r.f. power output to d.c. power input to the final amplifier, the efficiency is better than 70 per cent. The total r.f. output includes, of course, a good share of the driver output.

QST

D-A-N-G-E-R

ONE of the grimmest tales of accidents in the ham shack comes from an Oregon amateur who writes:

"Recently you have mentioned some of the near fatal accidents that have been the result of carelessness in radio work. Most have been caused by high voltage—but I wish to report a somewhat different near fatality.

"Near the inner door to our garage, I had stored a multisection mobile whip. Since it was eight feet high when assembled, I had to remove some of the sections in order to set it upright. The bottom four sections had been left leaning against the wall for about three months and not much thought given to it.

"But one night my father opened the inner

door, reached for a broom in the corner, hit the antenna and—when he reached down for the dustpan—ran the antenna five inches up his nose and into his sinus cavity.

"He bled quite badly and had to remain in the hospital for a day and a half. But the doctor said he was very fortunate. If the antenna had gone to the right or left, it would have gone into his eye cavity.

"If it had gone just a fraction of an inch farther forward, it would have killed him.

"This accident is one in a million, but it shows the potential accidents that can lie around our shacks. All of us could benefit by asking ourselves: 'How dangerous is that open knife on the bench?'"

• Recent Equipment —

Hallicrafters SX-111 Amateur-Band Receiver

THE Hallicrafters Model SX-111 is a double-conversion selectable-sideband receiver designed for reception of a.m., c.w., and s.s.b. signals. Using 13 tubes, including a rectifier and voltage regulator, it tunes all amateur bands between 80 and 10 meters, plus 10 Mc. for WWV reception. There is generous overlap on several bands so that some of the MARS frequencies can be covered. The i.f. system incorporates stepped selectivity offering five different band widths: 5, 3, 2, 1 and 0.5 kc.

Although most of the electrical features of the receiver, such as the notch filter, sideband selection, and variable-bandwidth i.f. selectivity, have been used in earlier higher-priced Hallicrafters models, the SX-111 has a completely new look from the mechanical standpoint. Housed in a one-piece gray cabinet (not shown in the photographs), it measures $18\frac{11}{16}$ inches wide, $8\frac{13}{16}$ inches high and $10\frac{5}{16}$ inches deep. The illuminated slide-rule dial escutcheon occupies nearly half of the front-panel area. Dial graduations, spread over a $9\frac{1}{2}$ -inch width, are marked at 10-kc. intervals on the 80-, 20- and 15-meter bands, and at 5-kc. intervals on 40 meters. On 10 meters the markers are every 25 kc. The various bands are spread over the same length of dial scale, giving an average tuning rate of 25 kc. per knob rotation on 3.5 Mc., 15 kc. per turn on 7 Mc., 20 kc. on 14 Mc., 25 kc. on 21 Mc., and 85 kc. on 28 Mc. (20 complete revolutions of the tuning knob to cover the scale). The main tuning control is flywheel-loaded to give a good tuning "feel."

An interesting feature of the cabinet is that there are no ventilation holes in the top, bottom or sides; instead, the cabinet is completely open at the back. Apparently this is sufficient for cooling purposes. This feature should find hearty acceptance among those who like to place various accessories on the cabinet top or those who are plagued by dust gathering in the receiver's "innards." The simple cabinet design plus the gray

and black color scheme and operating control layout give the SX-111 an attractively clean and modern look. The entire receiver weighs about 36 pounds.

A look at the block diagram in Fig. 1 shows a striking resemblance in tube line-up to the SX-111's big brother, the SX-101A.¹ The receiver starts off with a 6DC6 r.f. amplifier. An antenna trimmer adjustable from the front panel permits resonating the input circuit. The manual r.f. gain control, which is tied into the first r.f. amplifier stage in addition to other stages, aids in preventing overloading by strong signals.

Following the r.f. stage is the 6BY6 first mixer, V_2 , and the tunable local oscillator, V_3 . Here the incoming signal is converted to the first i.f. of 1650 kc. Good frequency stability in the local oscillator is assured by the use of air trimmer capacitors, ceramic coil forms, temperature compensation and voltage regulation. These two stages along with the r.f. amplifier are gang-tuned.

The 1650-kc. signals from the first mixer are amplified in the 6CB6 i.f. amplifier, V_4 . The receiver's S meter, calibrated in S units to 60 db. above S9, is a part of the i.f. amplifier's plate circuit.

After amplification in V_4 the 1650-kc. signals are converted to 50.75 kc. by the second mixer, V_5 . Either 1600- or 1700-kc. injection is provided for by the crystal-controlled oscillator, V_6 , for selection of either lower- or upper-sideband reception. The changeover is made by the flick of a switch on the front panel.

The 50.75-kc. signal goes through a bridged-T notch filter,² which helps to reduce heterodyne interference by notching out unwanted carriers, and then into a 50.75-kc. amplifier, V_7 . The five bandwidths are all centered on the same frequency, 50.75 kc., which is at one edge of the

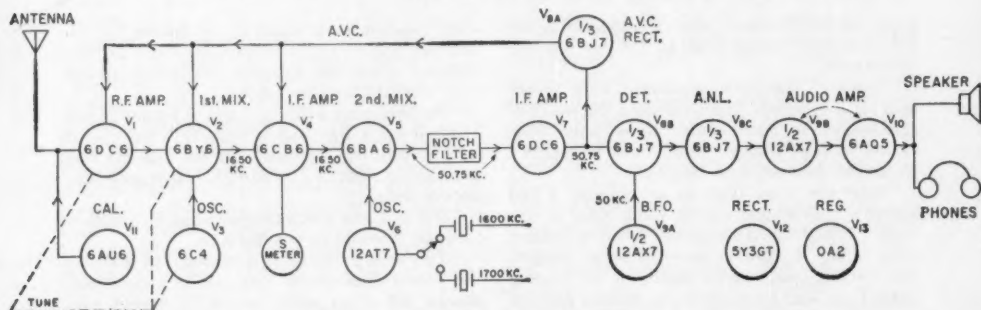
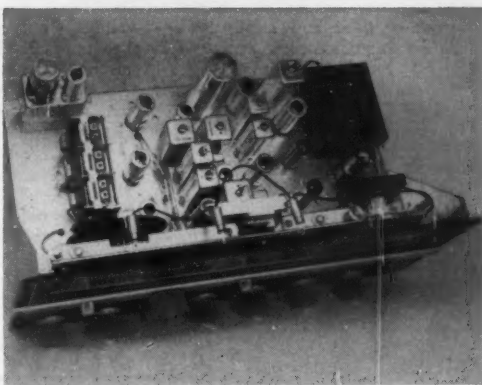


Fig. 1—Block diagram of the SX-111 Receiver.

This view of the SX-111 shows the 100-kc. calibrator crystal and tube on top of the subchassis in the upper left corner of the photograph. Just forward of the calibrator is the three-gang tuning capacitor. The power supply components are grouped along the right edge and the various i.f. cans and tubes are located in the center. The front panel, with the slide-rule dial window running almost its entire length, is partially visible. The two small aluminum knobs just below the dial are the antenna trimmer (left) and the dial-calibration reset. Other controls, from left to right, are: R.F. GAIN, BAND SELECTOR, A.V.C. (toggle switch), main tuning, SELECTIVITY, NOTCH FREQUENCY, AUDIO GAIN, FUNCTION and A.N.L. (toggle switch). Not visible in this photograph are the b.f.o. toggle switch just below the main tuning knob, and the phone jack just below the a.n.l. toggle switch.

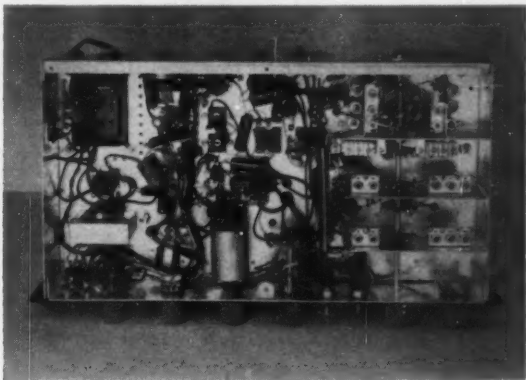


widest (5 kc.) band, so that the band width "grows out" to one side as the selectivity decreases. This is convenient for s.s.b. and c.w. reception, in contrast to a variable-selectivity system which expands symmetrically about a center frequency as the band width is increased. After amplification the signal is detected by a diode rectifier, V_{8B} .

An a.v.c. rectifier, V_{8A} , picks up its i.f. input from V_7 , and applies a.v.c. to the r.f. amplifier, V_1 , first mixer, V_2 , and the first i.f. amplifier, V_4 . The a.v.c. can be used in c.w. and s.s.b. reception, as well as for a.m. It has fast attack and recovery, the receiver gain being practically fully restored even in the small time interval between dots and dashes, with keying at ordinary hand speeds. The recovery time is not adjustable. If desired, the a.v.c. can be turned off from the front panel.

The 12AX7 beat-frequency oscillator, V_{9A} , can be turned on and off from the front panel, independently of the a.v.c. There is no panel-operated b.f.o. tuning control, since the sideband-switching system requires that the b.f.o. frequency be fixed in definite relationship to both the i.f. pass band and the exact frequencies of the two crystals in the second conversion oscillator. The b.f.o. oscillator plate voltage is regulated to insure frequency stability.

The receiver's front-end components are grouped along the right in this photograph with the oscillator compartment at the top, mixer in the center and the r.f. at the bottom. Ceramic coils and air padder capacitors are used in the oscillator section to insure good frequency stability. The cylindrical can at the lower center is a shield covering the notch-frequency inductor. Various projections along the rear apron at the top of the photograph are, from left to right: a.c. line cord, speaker terminals, S-meter zero set, mute terminals, antenna input terminals (coax fitting is visible between the screw terminals) and the band-switch shaft support.



A series-diode noise limiter, V_{8C} , can be switched into the circuit to reduce interference from pulse-type noise. Of course, this type of limiter is most effective on a.m. reception.

Audio circuits of the SX-111 include a 12AX7 voltage amplifier and a 6AQ5 power amplifier. Output impedances of 3.2 and 500 ohms are provided.

A 100-kc. crystal calibrator, V_{11} , enables accurate checking of the dial calibrations. Fig. 2

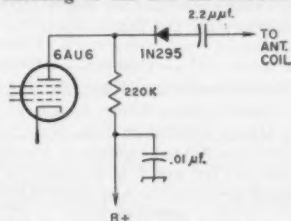


Fig. 2—Diode harmonic generator used with 100-kc crystal calibrator.

shows how a semiconductor rectifier is used as a harmonic generator, a feature not usually seen in run-of-the-mill calibrators. The use of the crystal diode insures strong marker signals in the top frequency range of the receiver.

The SX-111 power supply uses a 5Y3GT (V_{12}) full-wave rectifier and an 0A2 (V_{13}) voltage regulator. Regulated plate voltage is applied to the b.f.o. crystal calibrator and the high-frequency oscillator. Regulated screen voltage is used on the first mixer, V_2 , and the 1650-kc. i.f. amplifier, V_4 . The power requirement of the SX-111 is 83 watts at 115 volts a.c.

An 8-watt 2000-ohm resistor connected across the 115-volt line, ahead of the on-off switch, and mounted near the receiver's front-end components, heats the front-end area to keep it free of moisture. The constant heating makes the temperature change less severe when the receiver is turned on, reducing over-all drift.

Strays

HBR-16 Notes

To keep the record straight on the HBR-16, the Stray on page 35 of the April issue (HBR-16 Notes) was in error in saying that the specifications for C_7 and C_8 should be transposed in the caption for Fig. 1 of the original article in October 1959 *QST*. We misinterpreted Ted Crosby's letter on this point. The specs in Fig. 1 are O.K.; it was the reference to them on page 17 of the article that should be transposed. But either way, remember that it's worthwhile making slight changes in both values to see if you can optimize the receiver's performance.

The 14th edition of the *World Radio Handbook* is now available from Gilfer Associates, P. O. Box 238, Grand Central Station, New York 17, N. Y. This is a 200-page listing of broadcasting stations all over the world, giving hours of operation, frequencies, program schedules, and so on.

Of great interest to our Canadian friends will be the *Radio Amateur Licensing Handbook*, which is written specifically for the would-be amateur in Canada who wants study material for the Canadian license exams and who wants detailed information on licensing procedures in Canada. The author is Jim Kitchin, VE7KN, and the 100-page book is published by Radiotelephone Directories of Canada, Ltd., 119 West Pender St., Vancouver 3, B.C., at \$2.00.

"CQ Serenade" is the name of a song for which words and music have been written and published by VE2BR, VE2QS, and F9KT. Sheet music is available, as well as a 45 r.p.m. recording made by VE2QS and his orchestra. VE2QS, who bears a resemblance to Xavier Cugat, can be reached at 1310 Elizabeth St., St. Laurent, Montreal 9, Quebec.

A 2-meter Gonset Communicator Model 3057, serial #CM-14457, was stolen from the civil defense room in Rutherford, N. J., earlier this year. Anyone having information on this unit should contact, L. C. Sanford, W2LKW, Municipal Building, Rutherford, N. J.

In addition to the usual antenna and audio output terminals, connectors at the rear of the SX-111 include a phono fitting for a coaxial lead-in and a two-terminal muting connector tied into the receiver's manual r.f. gain-control circuit. The muting terminals are closed by a jumper wire when the send-receive switching is done from the receiver's panel controls, but may be operated through a remote switch or relay if desired.

The muting circuit is fast acting and substantially clickless, and can be used with a back-contact relay tied in with the keying system for c.w. break-in.

— E. L. C.

On board the U. S. Navy carrier *Shangri La* K4SRA has permission to operate his ham station while the ship is enroute from the Pacific to the Atlantic. The *USS Shangri La* departed San Diego on March 16 and after going around the Horn, will arrive in Norfolk, Va., the 6th of May. Look for K4SRA on 15- and 20-meter sideband.

The Meter Reader Gang of 160, a group of teenagers in southern Iowa, is looking for new members. They hang out near 1820 ke., every night at 1900, and anyone interested in joining up should contact K0TJN, Box 105, Osceola, Iowa.



(Continued from page 10)

Saturday, May 7, at the Dayton Biltmore Hotel. Space doesn't permit listing all the scheduled activities, but those who attend will find plenty to capture their interest. Technical talks, forums, informal get-togethers, hidden transmitter hunt, license examinations, equipment exhibits, v.h.f. and s.s.b. dinners, and a grand banquet are some of the features on the program. Advance registration (deadline is May 5) is \$5.50, including the banquet. For full information, and for registrations, contact Dayton Hamvention, P. O. Box 426, Dayton 1. For hotel reservations at the Biltmore, contact the Dayton Hamvention Reservations, Biltmore Hotel, 210 N. Main St., Dayton 2. There will also be a special program for the ladies, and the v.h.f. and s.s.b. dinners will be held on Friday evening.

Pennsylvania — The Breeze Shooter's Net annual hamfest will be held May 22 at "The Lodge" in North Park, Pittsburgh. No further details available at this writing.

Wisconsin — The 1960 Wausau hamfest will be held on May 21 at St. Theresa's School in Schofield. Sponsored by the Wisconsin Valley Radio Ass'n, meetings will start at 1 P.M. Registration will begin at 9 A.M., and a banquet will be served at 6 P.M. The price is \$3.75 per person, and there'll be activities for everyone. Send for reservations to Registration Chairman, WVRA Hamfest, Box 363, Wausau.

South Carolina — The hamfest of the Blue Ridge Radio Society and the Greer Radio Club will be held on May 1 at the American Legion Fair Grounds on White Horse Road in Greenville. Master of ceremonies will be W4MYJ. Activities begin at 0900, with a swap table. "Chicken and fish" will be served at noon, with all you can eat for \$2.50. For small fry there will be a special plate at \$1.00. For further information contact C. D. Mullinix, K4TOY, P. O. Box 1586, Greenville.

The authors have managed to find space in G3KEP's three-wheeled Frisky Sport not only for themselves but for the gear described in the article.

A Low-Power Transmitter-Receiver for 160 or 80 Meters



Low-Frequency Mobile

BY DAVID NOBLE,* G3MAW AND DAVID M. PRATT,** G3KEP

THE modern trend in mobile equipment seems to be toward the separate transmitter and receiver or converter arrangement. While this in itself is quite satisfactory in other respects, it does not result in maximum conservation of space—a vital consideration where the average small European car is concerned. For this reason, it was decided to make the receiver, modulator and transmitter in a single cabinet, with a vibrator power supply in the trunk. The complete unit is assembled on a $10 \times 7 \times 2\frac{1}{4}$ -inch chassis which fits into a $11 \times 8 \times 7$ -inch cabinet. (Closest U.S. sizes are 10 by 8 by $2\frac{1}{2}$ inches, and $14\frac{1}{2}$ by 8 by $8\frac{1}{4}$ inches.)

Because of the limited battery capacity, low power was essential. On 160 meters the maximum input power permitted in the United Kingdom is 10 watts. Therefore, this band was chosen because of the proportionately low competitive QRM level. Coil dimensions for the 75-meter band will also be included for those who prefer this band.

Transmitter

The transmitter is primarily crystal controlled, although provision is made for feeding in an external v.f.o. The oscillator comprises a 6BA6 in a Pierce circuit. Six crystals are provided, the desired one being selected by means of a seven-position, two-pole rotary switch, S_1 . The seventh position is taken to a coaxial socket, J_5 , at the rear of the chassis for connection to an external v.f.o. if this is desired. The power amplifier is a

Mobile operators who are tired of trying to buck the nighttime QRM on 75 may find relief in going to 160. Not only is the theoretical ground-wave coverage better on the lower-frequency band, but the power-level restriction in force at the present time also makes competition less severe. For those who prefer it, the unit is easily adapted to 75.

5763. The pi-network output coupling is designed to feed directly into the whip antenna. Because of the comparatively low power involved, ordinary broadcast-type variable capacitors are adequate in the output circuit.

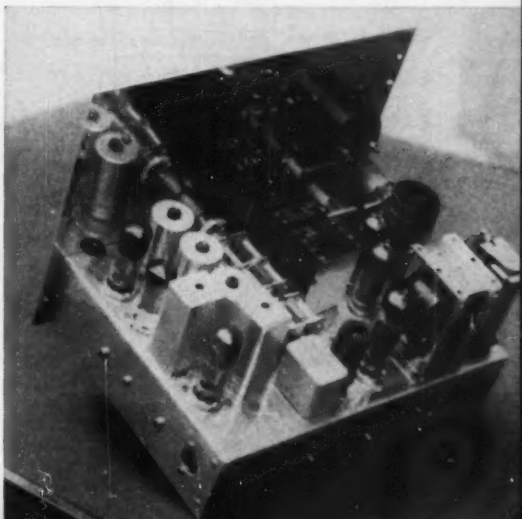
Modulator

Heising modulation of the plate and screen of the 5763 is effected by means of an audio section common to transmitter and receiver. The modulation inductor L_4 may be any small choke

* Heather Bank, Menston, Ilkley, Yorkshire, England.

** Lyndale Road, Eldwick, Bingley, Yorkshire, England.

In this view, the receiver section is on the left and transmitter on the right, with the audio section at the rear of the chassis. A row of crystals occupies the central area.



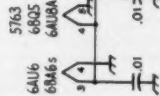


Fig. 1—Circuit diagram of the low-frequency mobile transmitter-receiver. Resistances are in ohms, and resistors are $\frac{1}{2}$ watt unless otherwise indicated. Disk ceramics are recommended for fixed capacitors having values from 1000 μ f. to 0.01 μ f. Fixed capacitors of smaller values, not listed below, should be mica or stable ceramic; larger values should be paper, except for capacitors marked with polarity which are electrolytic.

BT₁—3-volt A battery, or flashlight cells.

C₁, C₂, C₃—Silver mica.

C₄, C₅, C₆—Mica trimmer.

C₇—Triple-gang 100- μ f. variable (Bud MC-888).

C₈—1000- μ f. mica.

C₉—See text.

C₁₀—Midjet superhet variable, broadcast replacement type, sections in parallel (Allied 61 H 008).

C₁₁—Dual 12-k. variable, broadcast-replacement type, sections in parallel (Allied 61 H 059).

J₁—Open-circuit jack.

J₂, J₃—Closed-circuit jack.

J₄, J₅—Chassis-mounting coaxial receptacle (SO-239).

K₁—6-volt d.c. six-pole double-throw relay (see text).

L₁, L₂—1.8 Mc.—Approx. 23 μ h. on iron-slug form (Miller 21A258B1).

Antenna coil 28 turns No. 28 at ground end of L₁.

—4 Mc.—Approx. 6 μ h. on iron-slug form (Miller 21A686B1).

Antenna coil 5 turns No. 28 at ground end of L₂.

L₃—1.8 Mc.—Approx. 15 μ h. on iron-slug form (Miller 21A1558B1).

Tickler 20 turns No. 28 at ground end of L₃.

—4 Mc.—Approx. 4.6 μ h. on iron-slug form (Miller 21A4768B1).

Tickler 5 turns No. 28 at ground end of L₃.

L₄—Filter choke (see text).

L₅—1.8 Mc.—Approx. 54 μ h.—80 turns No. 24, 1-inch diam., 2 1/2

inches long (B & W 3016 or Aldux 8321).

—4 Mc.—Approx. 27 μ h.—40 turns 1 1/2 inches long, same as above.

M₁—50-ma. d.c. meter.

R₁—Linear potentiometer.

R₂—Audio-taper potentiometer.

R₃, R₄—See text.

S₁—Two-section 11-position rotary switch, 7 positions used (Centralab

PA-2005).

S₂—D.p.d.t. toggle switch.

S₃, S₄—S.p.s.t. toggle switch.

T₁—Standard or miniature 455-kc. permeability-tuned i.f. transformer, input (Miller 12-C1).

T₂—Same as T₁, but for output (Miller 12-C2).

T₃—Carbon-microphone transformer.

T₄—Universal speaker output transformer, 4500-ohm primary, 8 watts (Stancor A3825).

having an inductance of about 10 henrys with a d.c. rating of 80 ma. A carbon breast microphone is used because of the lower amount of acoustical background noise associated with this type of microphone. Two spring clips under the chassis retain the 3-volt energizing battery for the microphone, and this is made accessible without removal of the rig from the car through an opening in the bottom of the cabinet. The battery is connected via the change-over relay to the chassis. No audio gain control is provided as this was thought unnecessary and the modulation level is preadjusted by means of the potential divider R₃ and R₄. The total value of the potential divider should be about 500K, and the individual resistor values should be predetermined by experiment.

Receiver

To obtain good selectivity, and the high sensitivity advantageous in mobile work, a superhet design is employed. This is of conventional circuitry and consists of a 6BA6 r.f. amplifier, 6AU6 mixer-oscillator, 6BA6 i.f. amplifier and 1N34A germanium crystal diode detector. The r.f. and oscillator coils are British Denco noval-

based plug-in coils, but these, of course, may be replaced by any other suitable types. A three-gang 100- μ f. variable capacitor C₃ is used with sufficient padding to spread the 1.8-Mc. band over the whole of the capacitance swing. The i.f. transformers T₁ and T₂ are ordinary 465-kc. broadcast receiving types. A variable resistor in the cathode of the i.f. amplifier stage is used as an i.f. gain control. When this control is turned fully clockwise (toward ground), oscillation of the stage occurs, so providing facility for c.w. reception.

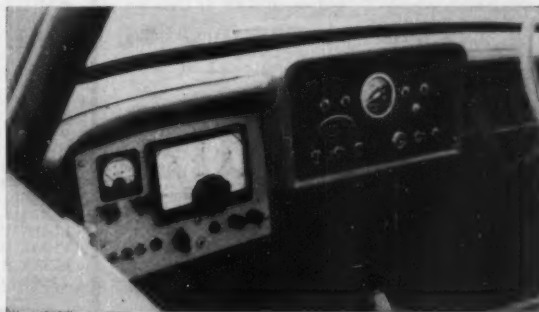
The degree of regeneration is predetermined by varying the input-to-output capacitance of the 6BA6. This is done by connecting a small length of insulated wire to the plate pin and bending it toward the control-grid wiring (C₄).

The output from the i.f. amplifier is fed to the semiconductor diode detector, and thence via the change-over relay to the audio section. An a.f. gain control is provided at the output of the detector. The headphone jack is so wired that the loudspeaker is disconnected upon insertion of the plug of the high-impedance headphones.

Change-Over Switching

Transmit-receive switching is done by means

The 160-meter mobile unit installed in the compact car of one of the authors. Below the meter are the controls for the pi network—tuning capacitor, left, and loading capacitor, right. Along the bottom of the panel, from left to right, are the send-receive switch S₁, the +B switch S₂, the c.w./phone switch S₃, key jack, crystal switch S₄, two microphone jacks (one for each operator), headphone jack, a.f. gain control and regeneration control R₁.



of a six-pole change-over relay.¹ This is operated from the heater supply and may be switched by either of two toggle switches—the first on the chassis itself (S_1), and the other on the dash for easy accessibility. In the receiving position (shown in Fig. 1), Pole 1 of K_1 (with S_1 closed) connects plate voltage to the receiver, and Pole 2 connects plate voltage to the audio section. Pole 3 connects the input of the audio amplifier to the detector output. Pole 4 connects the output of the audio section to the headphones and speaker transformer T_4 . Pole 5 connects the antenna to the receiver input. Pole 6 is shorted to ground.

With K_1 energized through S_4 (or the remote switch), Pole 1 connects plate voltage to the

¹If a six-pole relay is not available, two relays having poles totaling six may be substituted.

transmitter oscillator and to S_{2A} . S_{2A} connects the plate-supply input terminal of the final amplifier to the supply either directly for c.w. operation, or via Pole 4 and L_4 for phone. Pole 2 applies plate voltage to S_{2B} which is open in the c.w. position but which applies plate voltage to the modulator in the phone position. Pole 3 connects the microphone transformer T_3 to the input of the audio section. Pole 4 connects the modulator output circuit to the r.f. amplifier when S_2 is in the phone position as mentioned above. Pole 5 transfers the antenna to the receiver, and Pole 6 closes the microphone circuit.

The unit requires 300 volts at about 90 ma., and 6 volts at 3 amp. The antenna is a loaded 12-ft. whip mounted at the rear. The car, incidentally is only a bit over 9 ft. long! **QST**

25 Years Ago this month May 1935

... The issue 25 years ago was devoted to details of new receiver circuits and tubes. George Grammer discussed various 10-meter rigs as the 28 Mc. band took an upswing after nearly four years of silence on DX. ... CT2BK reported on his excellent results with a reflector system on his antenna. ... James Lamb gave readers a look at outstanding technical features on latest manufactured models of superhets.

... The DX Contest report chortled that all previous records were smashed to smithereens. More than 90 countries participated and ON4AU worked Ws and VEs on five bands, running up a score of 23,500—the highest continental score in early reports.

... The final report on the 1934 Sweepstakes also proclaimed all records shattered. 970 operators participated and "scores were of previously unheard magnitude ... nineteen over 70,000!" W9HKC won the affair with a score of 113,679.

... Most of the Editor's correspondents 25 years ago were complaining bitterly about phone harmonics and conversation of phone men.

... The Editor commented on bootleg operation in the five-meter band with non-hams buying cheap sets from mail-order houses and giving themselves a thrill by going on the air. Radio clubs and individual amateurs were urged to tackle dealers and non-licensed operators.

... Technical articles included notes on the V-doublet noise-reducing receiving antenna ... progress in ultra-high-frequency gear ... receiver selectivity characteristics ... push-pull-push oscillator circuits for 15-watt second-harmonic output ... and three pages of hints for the experimenter.

... And in the back of the book, an eager fellow offered to trade an adding machine and a 23-jewel watch for teleplexes.

Quist Quiz

We trust you didn't allow yourself to be misled last month by the four loop currents. Redrawing the circuit and properly labelling the three loop currents, you should have obtained an answer of $E_{out} = 3.7$ volts.

Silent Keys

It is with deep regret that we record the passing of these amateurs.

- W1JIM, Homer B. Smith, Gloucester, Mass.
- W1JZF, Durward L. Tracy, North Troy, Vt.
- W1LL, Earl C. Batchelder, North Attleboro, Mass.
- W2BCW, Larry Spector, Brooklyn, N. Y.
- K2DAR, Dr. W. Richmond Moyer, Lockport, N. Y.
- K2ERM, John J. Hale, Valley Stream, N. Y.
- W2FVX, Louis J. Rogers, Brooklyn, N. Y.
- K2HF, William J. Robinson, Camden, N. J.
- K2ZAS, George W. Rust, Bronx, N. Y.
- W3BIA/5, Albert K. Poole, Philadelphia, Pa.
- W3EFS, W3LAI, Dr. W. L. Belton, Philadelphia, Pa.
- W3NW, Joseph T. Marsden, Royersford, Pa.
- W3ONH, Dr. Willard P. McNeill, Spencerville, Md.
- W3RYF, Didrik J. Osedale, Landover Hills, Md.
- K4ABB, W4PZT, Ulmer J. Ezell, Okeechobee, Fla.
- ex-W4CIS, Henry G. Sandifer, Danville, Ky.
- W5BIX, Andrew J. Burton, Enid, Okla.
- W5GGR, Jerrold Oliver Hills, Rule, Texas
- W5MIU, Louis H. Hudson, Natchitoches, La.
- W5OEQ, Harry A. Carlson, Jamestown, N. Y.
- K6ALT, George C. Hermann, La Canada, Calif.
- K6BPC, Alpha A. Webster, West Covina, Calif.
- W6DVU, G. Manley Cole, Corona, Calif.
- K6JHL, Arnold L. Harrington, South San Francisco, Calif.
- W6OPP, Donald B. Tallman, Bakersfield, Calif.
- W6SKZ, Carl E. Sann, San Diego, Calif.
- W6SOW, Alexander H. Gies, Los Angeles, Calif.
- W6STS, Ford L. McGraw, Glendale, Calif.
- W6WUO, Frederick O. Hoffman, Santa Monica, Calif.
- W7TLY, Bennett S. Hyde, Flagstaff, Ariz.
- W7UHK, Edgar M. Woods, Oswego, Oregon
- W8FXN, Herbert H. Mills, Reynoldsburg, Ohio
- W8GGC, Harry B. Richards, Princeton, W. Va.
- W8HTP, Brooks M. Walker, Zanesville, Ohio
- W8ND, Carl H. Wesser, Presque Isle, Mich.
- W9ATG, Philip N. Macy, Greenfield, Ind.
- W9GZK, Walter H. Wickstrom, Kenilworth, Ill.
- W9JYA, Howard V. Chamness, Beech Grove, Ind.
- W9STB, Ernest K. Newlin, Terre Haute, Ind.
- W9PTK, Richard C. Edstrom, Springfield, Colo.
- KL7BMZ, Harry C. Sprague, Kodiak, Alaska
- LU9EV, Colin H. Grattan, Buenos Aires, Argentina
- VE3AL, A. H. Keith Russell, Toronto, Canada
- VETTT, Frederick George Bonsall, Chemsain, British Columbia

Armed Forces Day

ALL amateurs are invited to participate in the Eleventh Armed Forces Day amateur radio program on Saturday, 21 May 1960, co-sponsored by the Director, Naval Communications and the Military Affiliate Radio System (representing the Army Signal Corps and Air Force Directorate of Communications-Electronics).

Transmissions will be at twenty-five words per minute on the following schedules:

Time 21 May 1960	Call Sign	Frequencies (kc.)
220300Z (2200-EST)	WAR/AIR (Army & Air Force Radio, Wash., D. C.)	3347, 14,405, 20,994
220300Z (2200-EST)	NSS (Navy radio, Wash., D. C.)	3319, 4010, 6970, 14,480
220300Z (1900-PST)	A6RSA (Army radio, San Francisco, Calif.)	6997.5
	NPG (Navy radio, San Francisco, Calif.)	3319, 7595, 14,927.5
	NPD (Navy radio, Seattle, Wash.)	7455
	AG6AIR (Hamilton AFB, Calif.)	7832.5
211100GCT (2000 India)	NDT (Navy radio, Kami Seys, Japan)	2287.5, 4545, 9427.5, 16,445, 23,010

Each transmission will commence with a ten-minute CQ. It is not necessary to copy more than one station and no extra credit will be given for so doing. Transcriptions should be submitted "as received." Time, frequency, and call sign of the station copied shall be indicated as well as the name, call sign (if any), and address of the individual submitting the copy.

Part two of the program consists of a radio-teletypewriter transmission featuring a special message from the Secretary of Defense. Each participant who submits a perfect copy of this message will be awarded a certificate of merit signed by the Secretary of Defense.

Transmission will be at sixty words per minute on the following schedule:

Time 21 May 1960	Call Sign	Frequencies (Kc.)
220330Z (2230-EST)	WAR (Washington, D. C.)	3347, 14,405, 20,994
	NSS (Washington, D. C.)	3319, 7375, 14,480
220330Z (2130-CST)	AIR (Washington, D. C.)	7915
	A5USA (Ft. Sam Houston Texas)	5395
	NDS (Great Lakes, Ill.)	7455
	AG5FFR (Randolph AFB, Texas)	7305
220330Z (1930-PST)	AG6AIR (Hamilton AFB, Calif.)	7832.5
	A6USA (Army radio San Francisco, Calif.)	6997.5
220345Z (2145-CST)	NDF (New Orleans, La.)	6970
	NDW (San Francisco, Calif.)	3319, 7375
	NPD (Seattle, Wash.)	7455

Each transmission will commence with a period of ten minutes of test and station identification. At the end of the test period, the messages will

be transmitted. It is not necessary to copy more than one station and no extra credit will be given for so doing. The message should be submitted "as received." Time, frequency, and call sign of the station copied should be indicated as well as the name, call sign, and address of the amateur concerned.

Part three, the highlight of the Armed Forces Day amateur radio activities, features a military-to-amateur transmitting and receiving test, and will be conducted for all holders of valid U. S. amateur radio station licenses. Headquarters radio stations of the Army, Navy, and Air Force will operate on spot frequencies outside the amateur bands, establish radio contact with amateur stations, and acknowledge these contacts with a one-time Armed Forces QSL card. Each service headquarters station will acknowledge separately so amateurs will have an opportunity to qualify for three different QSL cards.

Military stations WAR, NSS, and AIR, will be on the air from 200000Z (1300 EST) to 220500Z (2400 EST) on 21 May 1960 to contact and test with amateur radio stations. Amateur contacts will be discontinued from 220245Z to 220400Z to allow Armed Forces Day c.w. and RTTY broadcast competitions. Military stations will operate on spot frequencies outside the amateur bands as follows:

Station	Military Frequencies (kc.)	Appropriate Amateur Band (Mc.)
War (Army radio, Washington, D. C.)	4020 (a.m.)	3.8 to 4
	4025 (s.s.b.)	3.8 to 4
	6997.5 (c.w.)	7. to 7.2
	20994 (c.w.)	21.1 to 21.25
	4010 (c.w.)	3.5 to 3.8
NSS (Navy radio, Washington, D. C.)	*4012.5 (s.s.b.)	7.2 to 7.3 & 3.8 to 4
	3319 (RTTY)	3.5 to 3.8
	6979 (c.w.)	7. to 7.2
	7375 (RTTY)	7. to 7.2
	14,385 (s.s.b.)	14.2 to 14.3
	14,480 (c.w.)	14. to 14.2
	20,075 (c.w.)	21. to 21.25
	**20,050 (RTTY)	
	see note	
	3347 (c.w.)	3.5 to 3.8
AIR (Air Force radio, Washington, D. C.)	7635 (a.m.)	7.2 to 7.3
	14,405 (s.s.b.)	14.2 to 14.35
	15,715 (c.w.)	14. to 14.2

*Operator transmitting on 4012.5 (s.s.b.) will listen in the a.m., s.s.b., sections of the 40 and 75 meter bands for a.m. or s.s.b. stations.

**NSS will key 20,050 kc. simultaneously with one of the RTTY frequencies listed above. This frequency will be utilized as frequency propagation conditions dictate.

Military stations will listen for calls from amateurs within the appropriate amateur bands. Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted.

Competition entries submitted to the Armed Forces Day Contest, Room BE-1000, the Pentagon, Washington, D. C. should be postmarked not later than 31 May 1960.

QST

● Technical Correspondence

A PLAN FOR IMPROVED UTILIZATION OF AMATEUR PHONE ASSIGNMENTS

139 Beekman Road
Summit, New Jersey

Technical Editor, QST:

The major deterrent to 100 per cent effective communication with other amateurs is QRM. Since the old spark days, QRM has been with us. Many improvements in the reduction of transmitter band width and increasing receiver selectivity have been made in the past forty years, but at the same time we have increased in numbers twentyfold—so QRM is still with us. In fact, it is worse than ever, with hundreds of high-powered transmitters joining our ranks every month, adding to the thousands already on the air.

Despite the increasing use of single sideband, a casual examination of the logs of yesteryear will undoubtedly reveal that s.s.b. and a.m. operators alike are suffering a reduction in their operating enjoyment as it becomes increasingly difficult to communicate with others. Can we do anything to check or reverse this trend? The answer is an emphatic "yes."

Two changes in our operating practices are required on our crowded phone bands. One is to utilize a voluntary carrier-frequency allocation plan in the United States during the hours of peak amateur activity. The other is to take advantage of single-sideband communication to the fullest extent by the use of "interlaced" single-sideband transmission.

Under the FCC rules you can operate on any carrier frequency (or carrier-reference frequency, in the case of s.s.b.) between 3800 and 4000 kc. as long as one sideband doesn't hang out on either end of the band. But it should be quite obvious that random carrier frequency selection creates terrific heterodynes to mar everyone's a.m. reception, and the random admixture of sideband components on both a.m. and s.s.b. due to random carrier frequency selection also reduces everyone's ability to obtain the desired intelligence from the background mess of incoherent voice components. However, if everyone stays on selected frequencies, the interference in the main will "speak English" instead of the present cacophony of whistles, pops, squeals, moans and semi-coherent speech. If you are convinced that your "c.s.s." (communication success ratio) can be improved by eliminating this sort of QRM you have been properly prepared to examine the proposed 75-meter carrier allocation plan shown in Table I in an objective manner. If you and the majority of 75-meter men use it, it will increase everyone's c.s.r., but it means giving up the practice of hunting for a hole in the QRM except at the carrier frequencies listed in the table.

The allocation table covers both American and Canadian telephone assignments in the 3750-4000-kc. band. For a number of reasons which will be discussed later, the use of

TABLE I

Carrier-Frequency Selection Chart for A.M. and Interlaced S.S.B. Telephone 3750-4000 Kc.

3751.0	3835.0	3919.0
3755.0	3839.0	3923.0
3759.0	3843.0	3927.0
3763.0	3847.0	3931.0
3767.0	3851.0	3935.0
3771.0	3855.0	3939.0
3775.0	3859.0	3943.0
3779.0	3863.0	3947.0
3983.0	3867.0	3951.0
3787.0	3871.0	3955.0
3791.0	3875.0	3959.0
3795.0	3879.0	3963.0
3799.0 Can.	3883.0	3967.0
3803.0 U. S.	3887.0	3971.0
3807.0	3891.0	3975.0
3811.0	3895.0	3979.0
3815.0	3899.0	3983.0
3819.0	3903.0	3987.0
3823.0	3907.0	3991.0
3827.0	3911.0	3995.0
3831.0	3915.0	*3999.0

† Upper Sideband Only.

* Lower Sideband Only.

a 4-kc. carrier-frequency separation is recommended. This gives us 50 U. S. carrier frequencies (3999.0 kc. cannot be used for a.m.) and 13 additional exclusive Canadian carrier frequencies (3751 kc. cannot be used for a.m.).

It should be stressed that the writer is suggesting the voluntary use of this plan and that it is a part-time plan to be used primarily from 5 p.m. local time until 75-meter phone activity dies down around midnight. During the balance of the day or night, activity on 75 is so limited it is not necessary to employ the plan, although it will do no harm to adhere to it all the time.

Now that we have established a carrier-frequency allocation table, it is time to look into this "interlaced sideband" business which was mentioned a few paragraphs back. We can define single-sideband interlacing as the simultaneous transmission of two different voice signals in substantially the same pass band using a suppressed-carrier upper-sideband signal to transmit one voice and a lower-sideband suppressed-carrier signal to transmit the other voice.

Yes, OM, sideband interlacing works FB, as you can readily determine for yourself from that best of all teachers, your own experience. Pick up a partner to experiment with, zero in on a lower-sideband round table, note the frequency, move down the band 4 kc., and flip to upper sideband.

Where did the round table disappear to? The answer, in part, is that the power in human speech is far from uniform throughout the range of voice frequencies. Studies of

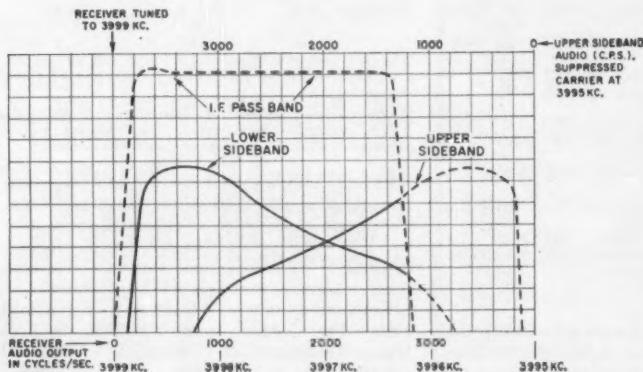


Fig. 1—Interlaced upper- and lower-sideband voice-power distribution with 4-kc. carrier separation and equal signal levels. Receiver tuned to lower sideband with a 2.5-kc. pass band. Power distribution curves are based on average power-vs.-frequency characteristic of speech combined with cutoff characteristic of transmitter audio circuit (cutoff frequency approximately 2700 c.p.s.).

the distribution and intensity of all vocal phonetic sounds indicates that, with exception of a few sibilants between 3 kc. and 5 kc., the predominant energy is between 250 cycles and 2800 cycles. As every sidebander knows, you can take advantage of this fact and lop off the voice frequencies above 2.7 kc. and below 250 cycles without hurting intelligibility a bit. Another factor is that the speech components of the unwanted sideband are inverted by the carrier inserted to select the wanted sideband. This inversion process converts the unwanted speech components into incoherent noise.

This action is illustrated in Fig. 1, where the upper sideband of one voice transmission and the lower sideband of another are interlaced in a pass band 4 kc. wide. Here we find that the major portion of the signal energy of one sideband will not interfere with the other. Only relatively unimportant high-frequency components of the unwanted sideband appear in the receiver pass band. The high-frequency components of the unwanted sideband are converted to pips of low-frequency noise when they beat against the inserted carrier frequency; conversely, the unwanted low-frequency energy is converted to high-frequency energy, but the sharp receiver i.f. cutoff eliminates most of it when the receiver is tuned to the desired signal as shown in Fig. 1.

If the carrier is inserted at 3995 kc., the situation will reverse itself. If both carriers are inserted in the i.f. of the same receiver, both upper- and lower-sideband voices can be heard with a minor shift in tuning.

By eliminating a.m. carrier heterodynes and improperly-intermixed sidebands through the use of pre-planned carrier-frequency selection, the QRM generated by those already in communication will be reduced by a substantial amount. The "have note" (those seeking a QSO) will have a much easier time of it in finding a spot to call CQ or answer a station calling CQ. The probability of establishing communication is thus increased. The amount of QRM that is generated in trying to establish communication will be decreased. This, in turn, will increase the probability of carrying existing QSOs through to successful conclusions. In short, everyone's c.s.r. can be boosted with a bit of self-discipline in the choice of carrier frequencies in our phone operations. This also will permit the use of interlaced s.s.b. operations, thus doubling the number of voice channels for this type of operation and giving the increasing horde of sidebanders a substantial amount of relief in their efforts to find talking space in the band. We have nothing to lose but the chains of operating habits that had their origins in practices that were forced upon us by the limitations of the equipment we were using the distant and not-too-distant past. Precise transmitter frequency control is available to everyone today and the woods are full of hams with extremely-stable communications receivers with a.m., l.s.b. and u.s.b. outputs.

Just use the frequencies in the allocation table the next time you go on the air and don't worry about whether George does or not. If 20 per cent of the stations on the air use them, the probability of successful QSOs on other carrier frequencies will start to decrease very rapidly, while those "on frequency" will obtain many more solid QSOs.

— D. A. Griffin, W2AOE

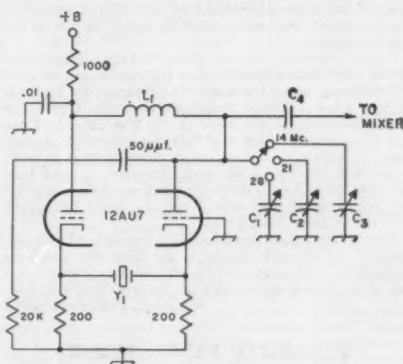
THREE-BAND SINGLE-CRYSTAL CONVERSION OSCILLATOR

500 Houston Court
Alexandria, Virginia

Technical Editor, QST:

The interest in crystal-controlled converters for the higher-frequency bands prompts me to send you the accompanying circuit. The conversion oscillator technique might be of value to those whose wallets may be described only in two dimensions.

The 3.5-Mc. crystal is used on the 3rd, 5th, and 7th overtones to cover, respectively, 20, 15, and 10 meters. Oscillator switching is accomplished by switching trimmer capacitors in the Butler oscillator tank circuit. On all these bands the receiver tunes forward since the fixed conversion oscillator is on the low side and the i.f. starts at approximately 3.5 Mc. Since the overtones are not harmonically related to 3.5 Mc. there is a slight displacement of the lower band edges from the 3.5-Mc. tuning position of the receiver. This amounts to about 8 kc. for 20 meters, 9 kc. for 15 meters, and 10 kc. for 10 meters with the 3505-ke. crystal (Peterson type Z-2) now in use; a 3502-ke. crystal of the same type gave a larger offset for 20 meters



W4TKR's single-crystal oscillator circuit for covering 14, 21 and 28 Mc. in a crystal-controlled converter. The 3rd, 5th and 7th overtones are used for the three bands. The oscillator tank circuit should tune to the oscillation frequency in each case—approximately 10.5 Mc. for 14 Mc., 17.5 Mc. for 21 Mc., and 24.5 Mc. for 28 Mc. Separate tank circuits of ordinary design can be used, but W4TKR simply switches trimmer capacitors with a single coil, as shown. This requires that L_1C_1 tune to 24.5 Mc. with a low value of capacitance at C_1 , in order to achieve a reasonable L/C ratio at 10.5 Mc. The value of C_1 should be adjusted to give the desired coupling to the mixer. (Note: The grid of the left-hand triode should connect to the top of the 20K resistor.)

and a larger dispersion between 20, 15, and 10 meters.

It is interesting to note that the 7-Mc. band could be beat down to 3.5 Mc. by using the fundamental frequency of the crystal, but the oscillator signal would come directly through the mixer at the crystal frequency and so would the second harmonic of the crystal, which falls in the 7-Mc. band. Three possible solutions suggest themselves: One is to use a second crystal somewhat lower than 3.5 Mc. for the 40-meter band only. Another is to accept more of a dispersion of the higher-frequency bands and use a single crystal with a frequency a little below 3.5 Mc. The third method would be to use a crystal with small dispersion among the high-frequency bands but one which would permit tuning 40 meters with the oscillator on the 3rd overtone (about 10.5 Mc.). In this case the 7-Mc. band would tune backward, from about 3.5 Mc. to 3.2 Mc. It has been assumed that the overtones will be lower than the harmonics of the fundamental, which is my experience with the two crystals mentioned.

A converter such as this with some 40-meter provision would be a valuable accessory for one of the 3-6-Mc. Command-set receivers.

— James A. Murray, jr., W4TKR

IT BEATS US, TOO.

34 Ashley Drive
Rochester 20, New York

Technical Editor, QST:

Here's one that "has me beat," and since none of my acquaintances can offer a logical explanation, I'm passing it along to you for comment.

During the winter we had a very severe ice storm here. Freezing rain fell for over 24 hours. Everything was heavily coated with ice, including my antennas. The antennas were loaded down and sagging rather badly, so I thought I'd see if operating for a while would help melt the ice.

Accordingly, I fired up on 40 meters, using my coax-fed half-wave dipole, and after about an hour's operating went outside to assess the results. I was mildly puzzled to see that half of the antenna was clear of ice and the other half (from the center insulator out to the mast) appeared to be as iced as before. I scratched my head a bit but rationalized that since the half that had melted was partially over

not usually show up on the magic-eye or meter-type record-level indicators. To prevent crushing the aync pulses, then, s.c.a.m. should be recorded with the "eye" about 1/3 closed. In s.c.f.m., it is important that some audio be recorded on the tape even when the signal fades into the noise. Some over-recording is permissible if it is found necessary in order to record the bottoms of the fades. The s.c.f.m. and s.c.a.m. transmissions will be identified on voice, and of course station identification will be given every ten minutes. — *Cophorne MacDonald, W4BCW*

TROPOSPHERIC SCATTER

General Telephone Service Corp.
730 Third Ave.
New York 17, N. Y.

Technical Editor, *QST*:

The article by Mr. John R. Amend, W7UIY, on "Radio Propagation" in the February, 1960 issue of *QST* is a very good presentation of this complex subject.

Mr. Amend did not mention the various fading effects encountered on the microwave frequencies and in connection with tropospheric scatter propagation. It is necessary for commercial-grade communications (usually defined as 99.99 per cent reliability) that consideration be given to the effects of fading when planning microwave systems. It may be of interest that the AT&T Co.'s TD-2 microwave circuits, which operate in the 4-kMc. common-carrier band, were engineered for a 40-db. fade margin. The Lenkurt Type 74 microwave installations, used by General System telephone companies in the 6-kMc. common-carrier band, are usually designed to provide for 35-40-db. fade margins. Frequency diversity is used in both of these line-of-sight microwave systems to overcome the adverse propagation effects.

Tropospheric scatter circuits such as the Florida-Cuba installation often require both frequency and space diversity operations to approximate commercial-grade telephone reliability requirements. Special receiver combining techniques are employed to maintain the continuity of transmissions. . . .

In general, line-of-sight microwave circuits with frequency diversity protection can provide multi-channel

telephone channels with reliability comparable to wire lines. The same thing, however, should not be expected of radio circuits utilizing ionospheric or tropospheric scatter types of propagation.

— *David Talley, W2PF*

2023 Overbrook Road
Lynchburg, Virginia

Technical Editor, *QST*:

I agree with W7UIY's statement ("Radio Propagation," *QST*, February, 1960, page 23) that the amateur "reader will profit from an awareness of the state of the art as applied by industry," and to this end want to enlarge upon his tropospheric scatter explanations.

Until just a few years ago tropo-scatter path losses of around 200 db. were the maximum allowable losses consistent with state of the art. In 1955-1957 the Lincoln Laboratories of MIT conceived a single-sideband multi-channel tropo system which was built by the Communication Products Department of the General Electric Company and now provides the Air Force with communications between Thule, Greenland and Cape Dyer on Baffin Island, a total distance of 691 statute miles. This system has a path loss of 258 db. . . . This system utilizes 120-foot parabolic reflectors, quadruple-diversity reception, 2-db. noise-figure receivers, and 20-kw. p.e.p. s.a.b. amplifiers in the 350-450-Mc. region. Prior to 1957 most tropospheric systems utilized the frequency-modulation mode but s.a.b. has its proponents in this service, too!

During development of this system a domestic path approximating the eventual Arctic path was picked with sites near Boston, Mass., and Winston-Salem, N. C. So the story goes, during construction a certain 2-meter enthusiast used to climb the 40-foot antenna feed tower at the Boston site during lunch hour with his 2-meter Gonset for a few QSOs. Imagine how the credibility of "I'm running 7 watts and the antenna here is a 120-foot parabolic reflector" was questioned!

In summary, s.a.b. with its advantages is now providing a practical multichannel tropospheric scatter system over a 700-mile span, almost ionospheric-propagation type distance. Real DX for tropo! — *Richard A. Powell, W4LNJ*

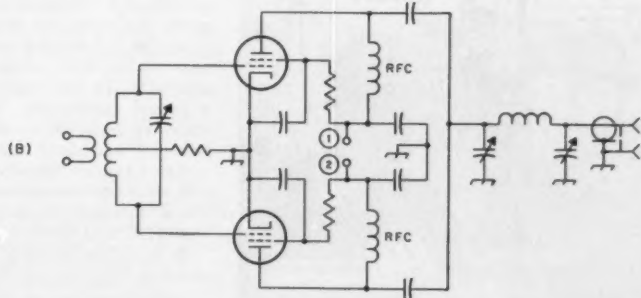
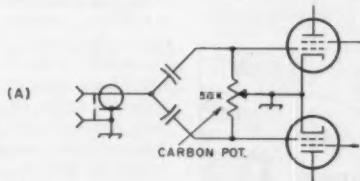
D.S.B. BALANCED MODULATOR

43450 Reservoir Road
Plymouth, Mich.

Technical Editor, *QST*:

In connection with the d.s.b. system described in April *QST* (Rockafellow, "High-Level Balanced Modulator for D.S.B."), carrier suppression does not seem to be difficult from 160 through 10 meters, but the higher frequencies offer more of a problem. This is probably because of the greater effect of tube capacitances at these frequencies. The method of balance control shown at A in the accompanying figure seems to help this condition at the higher frequencies.

Also, some of the fellows might like a pi-network output tank. The circuit can be rearranged to use one as shown at B. In this arrangement the phase reversal is accomplished in the grid circuit and an additional tuned circuit is required. — *Stuart Rockafellow, W8NJJH*



Circuit for adjustment of modulator balance (A) and high-level balanced modulator circuit using pi-network output tank (B). Values in these circuits are similar to those given in April *QST*, page 23 (W8NJJH).

W9IOP (right) receives the Francis A. Burke (W3AAX) Memorial Award from W8DUS, president and W9IOP's boss at Electro-Voice. Larry scored 1336 contacts in 73 sections for 243,056 points, a new SS high. This trophy, donated by W3GJY, is presented annually to the top SS scorer, in memory of a deceased amateur. W8DUS was kind enough to make this fitting presentation in behalf of W3GJY.



when you were hungry, whispered words of encouragement into your ear when despondent, lighted your cigarette with the onset of a nicotine fit, brought you slippers when the footsies got nippy, and threw you out of the house when the contest was over, you no good lazy crumb.

E is for the *energy* that you burned in wearing out two bugs, 37 pencils, and one left foot.

E is also for the *emergency* that developed when smoke billowed forth from ye olde de transmitter. Why does it always wait for a contest to malfunction?

P is for the *power* multiplier of which you and almost everybody decided to take advantage. You were running under 150 watts weren't you?

S is for the *satisfaction* of knowing that you put forth your best effort. If you didn't get a chance to jump in head first this year, there's always next year, as the saying goes.

T is for the *time* you devoted to your grand effort. Maybe you couldn't fit in the full forty hours, but it was fun for even forty minutes.

A is for the *alibis* you had to contrive down at the club meeting, after not living up to expectations.

K is for the *kilowatt* for which you yearned, when the QSO per hour average sank way down to almost nothing.

E is for the *extra* little bit of effort that the section winners displayed in overcoming the trying moments of various types of adverse conditions.

S . . . well, S is for *Sweepstakes* itself — the sum total of operating joy. En masse, all contest operating frolic lumped into one word. S is also for the *stations* themselves that participated . . . those stations which all are proud to see both in enconium and score.

From coast to coast . . . from Podunk Hollow to Snoopy Falls, Idaho . . . from One Horse, Yukon to Bab-O, Canal Zone . . . did the Sweepstakes bug (order Lepidoptera) take its

toll. The Eastern seaboard, up New England way, the land of the Pilgrims and Paul Revere, found real hot races in Maine, New Hampshire, and Eastern Massachusetts. In the latter, two El-Ray buddies battled for the top slot with W1DDF/1 winning the East Mass. certificate with 176,021 points; with fewer contacts than W1OGU, the clean sweep of 73 payed off. In N. H. K1JDN made a bold attempt at the prize by running a kw., but the multiplier beat him out by a whisker, as W1CUL came through with 97,185 points. And "down Maine" W1BCD whistled past W1GKJ to the tune of "shave and a hair cut — two bits" by a mere 1000 points to post victory in the Pine Tree state. Reminisced much-travelled W1SWX/1: "I certainly enjoyed operating SS in Vermont these past two years. Had more fun than when I won for South Dakota in 1952. But where was Idaho? I should have gone there instead of Vermont."

Moving over to the stomping grounds of Peter Stuyvesant and Henry Hudson, K2DGT whomped up 232,870 points via 1276 contacts in all 73 sections to capture N. Y. C.-L. I. laurels and lead all other W2/K2 clan. Meanwhile in Eastern New York, CD Party enthusiast K2EIU squeaked by K2UPD by virtue of having four more sections. And soothsayer K2MWK forecasts: "Before the 1965 SS I predict (1) stations close to 300K; (2) fifty stations above 200K; (3) Novice scores above 75K; and (4) second and third place certificates for runner-ups in active places like E.P.A., L.A., Ohio etc."



W0AIH/VE3 wouldn't mind having contests on other days than Sundays, for "preaching and contests don't seem compatible." But that didn't halt the top Canadian scorer, a Lutheran minister, from pouring the soup into an 80 meter doublet, 40 meter ground plane, and tri-band quad to score 154,851.

May 1960

The Quaker territory of William Penn produced, as usual, a multitude of entries from the Frankford ensemble sowing the seeds of rivalry galore. After forty gruelling rounds with Mike Murphy, W3JNQ outscored other high-scoring E.P.A. stations with 1275 QSO's in 73 sections, for 232,688 points. A tear should be shed throughout the land, such as to fill a reservoir to service the city of Philadelphia, for W3BES and W3ALB, both scoring over 200K, but yea no section certificate to show for it. The Western part of the state with far less rugged competition, nevertheless,

produced a real race to the wire with W3GJY breaking the tape just ahead of W3YDK by a minute 400 points. And across the Chesapeake, contest author W3EIS posted 224K, nabbing all 73 sections.

In the territory of Sir Walter Raleigh, there is but one who reigns supreme — Vic Clark, W4KFC, leading the Potomac Valley posse with 238,710 credits by 1313 QSO's in 73 sections. Dredge that Philadelphia tear reservoir and pitch the brine into the harbor of Newport News in memory of W4YHD with 219K and W4RQR

C. W. WINNERS, 26TH A.R.R.L. SWEEPSTAKES

Section	Call	Score	Transmitting Equipment	Receiving Equipment	Bands Used
E. Penna.	W3JNQ	232,688	G5B100-813	75A4, HRO60	80, 40, 20, 15, 10
Md.-Del.-D. C.	W3EIS	224,840	Ranger-813	51J	80, 40, 20, 15, 10
S. N. J.	W2HDW	175,950	DX100	HQ140X	80, 40, 20
W. N. Y.	K2MWK	191,443	Viking II	75A1, converter	80, 40, 20, 15, 10
W. Penna.	W3GJY	105,840	5100	HQ129X	80, 40, 20, 15
Illinois	W0YFY	210,005	Apache	75A3 (slicer)	80, 40, 20, 15, 10
Indiana	W9IOP	243,056	PTO-6A450-1-65A (p.a.)	RME6900	80, 40, 20, 15, 10
Wisconsin	W9RQM	209,328	VFO-807-813	HRO50T	80, 40, 20, 15, 10
No. Dakota	K9IVQ	75,400	HT16-814	SX71	40, 20, 15, 10
So. Dakota	W8MSV	122,404	Ranger-Courier	HRO50T	80, 40, 20, 15
Minnesota	K0RHO	76,148	Ranger	SX99	20, 15
Arkansas	K5GRT	77,000	DX35	RME4350	40, 20, 15, 10
Louisiana	W5YDC	209,875	VFO-811As	NC183	40, 20
Mississippi	K5IIN	116,156	5100B-Linear (kw.)	75A4	80, 40, 20, 15, 10
Tennessee	K4LPW	221,829	HT32	SX101	80, 40, 20, 15, 10
Kentucky	K4GSU	200,020	HT32A, Ranger-1-125	75A4	80, 40, 20, 15
Michigan	W8SCW	119,565	Valiant	NC300	80, 40, 20, 15, 10
Ohio	W8LQA	198,059	VFO-807-813	HQ129X	80, 40, 20, 15, 10
E. N. Y.	K2E1U	138,256	Apache	SX101A	80, 40, 20, 15, 10
N. Y. C.-L. I.	K2DGT	232,870	DX100B	SX101, NC303	80, 40, 20, 15, 10
N. N. J.	W2DMJ	175,500	Subtracto-75T; Collins VFO	HRO5	80, 40, 20, 15, 10
Iowa	W0VXO	170,510	DX100 (modified)	HQ140XA, DB23	80, 40, 20, 15, 10
Kansas	W0BYV	65,772	Navigator-4-250A	75A2	40, 20, 15, 10
Missouri	W0TDR	146,300	DX100	75A2	40, 20, 15, 10
Nebraska	W0NYU	153,790	Valiant	75A4, SX25	80, 40, 20, 15, 10
Connecticut	W1MHF	180,000	Viking I; Ranger; HT32	75A4	80, 40, 20, 15, 10
Maine	W1BCD	98,325	DX100; Elmac A54	SX25, Heath Q mult	80, 40, 20, 15, 10
E. Mass.	W1DDP/1	176,021	6AU6-6CL6-2E26-9000 (par.)	75A3	80, 40, 20, 15, 10
W. Mass.	W1ROB	146,584	VFO-2E26-1-65A-1-400	Homebuilt (16 tube)	80, 40, 20, 15, 10
N. H.	W1CTL	97,185	2E26-6146	75A3	80, 40, 20
R. I.	W1LQA	117,075	VFO-6C46-5763-1X150A	S76	80, 40, 20, 15
Vermont	W1QMM	78,229	6AH6-6CL6-6CL6-807-813	Homebuilt (double conv.)	80, 40, 20, 15, 10
Alaska	KL7CDF	163,800	Collins 431B1, KWM-1-Courier	51J4, KWM-1	40, 20, 15, 10
Idaho	K7DAS	34,148	DX40; ARC5	SX99	80, 40, 20, 15
Montana	K7ABV	75,793	DX35-6146	SX99	80, 40, 20, 15
Oregon	W7JHA	120,420	Valiant	HRO60	80, 40, 20, 10
Washington	W7HMQ	205,313	VFO-Viking II	HRO50	80, 40, 20, 15, 10
Hawaii	KH6HAA	79,696	Navigator-Thunderbolt	HRO50T1	40, 20, 15, 10
Nevada	W7KEV	184,336	807-4-65A	HQ129X	40, 20, 15
Santa Clara V.	W6UTV	181,760	VFO-1X150B	75A4	80, 40, 20, 15
East Bay	W6KG	181,588	Ranger-1X250	75A4	80, 40, 20, 15, 10
San Francisco	W6SLJ	122,063	VFO-1-65A	NC300	40, 20, 15, 10
Sacramento V.	K0SXA	190,165	Ranger	NC300	80, 40, 20, 15, 10
San Joaquin V.	W6BVM	85,410	Viking I	75A2	80, 40, 20, 15, 10
No. Carolina	K4IEH	158,114	Ranger	SX99	80, 40, 20, 15
So. Carolina	W6BWZ	80,695	VFO-6AC7-6V6-807	SX71	80, 40, 20, 15, 10
Virginia	W4KFC	238,710	VFO-807-1E27	75A2	80, 40, 20, 15, 10
West Virginia	W8DIE	124,373	VFO-813	HRO	80, 40, 20, 15
Colorado	W0CDP	200,750	Valiant	NC300	80, 40, 20, 15, 10
Utah	W7QDJ	76,045	Viking II	Super Pro; BC770B	80, 40, 20, 15
New Mexico	W3CK	143,065	DX100	Mohawk	80, 40, 20, 15, 10
Wyoming	W7HRM	68,680	10A-813	NC200, DB20, slicer	80, 40, 20, 15
Alabama	KJCFD/4	133,860	5763, 5763, 6146, 813	SP400X	80, 40, 20, 15
E. Florida	W4DQS	216,901	Viking II	75A3	80, 40, 20, 15, 10
W. Florida	W1WQK	120,450	Lyco 600-813	NC183D	80, 40, 20, 15
Georgia	K4BAI	137,751	HT18-807-807-100TH-100TH	SP400X, preselector	80, 40, 20, 15
West Indies	EP4AOO	62,510	Ranger	HQ110	20, 15, 10
Canal Zone	KZ8TD	76,388	Viking I; 6AG7-6146; ARC5	RME DB22A; HQ129X	80, 40, 20, 15, 10
Los Angeles	K6CEF	184,680	6BE6, 6BA6s, 6CL6, 6146s	75A3	80, 40, 20, 15, 10
Arizona	K7IDI	104,300	32V1	75A4	80, 40, 20, 15, 10
San Diego	W6ZVQ	211,153	5100	75A3	80, 40, 20, 15, 10
Santa Barbara	W6YK	100,886	Globe King	NC303	80, 40, 15, 10
No. Texas	W3MCT	161,352	32B1-1-400A	NC303	40, 20, 15
Oklahoma	K3OCX	71,904	Apache	HQ170	40, 20, 15, 10
So. Texas	K5LZO	177,090	HT32	75A4	40, 20, 15, 10
Maritime	VE1RW	89,765	Valiant	NC303	40, 20, 15, 10
Quebec	VE2AZN	73,920	DX100	SX100	80, 20, 15
Ontario	W9AIH/VE3	154,851	Ranger-4-125A	75A3	80, 40, 20, 15, 10
Manitoba	VE4SA	3371	Viking II	NC46; RME HF10-20	20, 10
Saskatchewan	VE5DZ	53,568	6AG7, 616, 807, 813	HRO	80, 40, 20, 10
Alberta	VE6MA	48,870	Ranger	Skyrider	40, 20, 15, 10
B. C.	VE7CE	92,893	Valiant	NC300	80, 40, 20, 15, 10

You think it's impossible to be neat and score high besides? Well gander at this willya, for this is really something to behold. Believe it or not this log is the *original* log used during the contest, not copied over afterward. And to ensure against duplicate contacts a check sheet, KFC-style. Yep, this immaculate masterpiece belongs to W4KFC. How does your log compare with this acme of perfection?

THE CASE OF THE MISSING OP AID NO.6

STOP CALLING ME,
YOU CLOD; I'VE ALREADY
WORKED YOU
THREE TIMES



with 210K, neither of whom bagged a certificate. K4LAY offered: "I hope Alabama was well represented this year. Our club really tried to get some stations on the air, as we saw in previous years only a few contacts were turned in by stations in our fair state." As W4FFF (not stuttering)

moaned: "The receiver didn't konk out as in 1955 (got new 75A4); antennas didn't fail as in 1956 (put up cubical quad); and the h.v. transformer didn't short as in 1958 (got *two* pole pigs). But W4DQS moved here from W8-land. What a shock to get his number 1135 for my 1017 at 2100 Sunday evening. Oh well, next year I'll take my vacation in November, again." Anyone botch up these key-twisters: W4KXV and W4KVX?

The cry, "Remember the Alamo," and the frolic of the Mardi gras, brings us to the Fives where W5YDC invaded 40 meters, which coupled with his usual one-hand 20 meter effort, clobbered Louisiana and W5/K5 entrants with 209,875 points. South Texas winner K5LZO again had to battle W5WZQ tooth and nail with 177,000 to W5WZQ's 175,903. In the Northern part of the range W5MCT eluded the onslaught of K5VLN.

No, this is not the V.H.F. section of QST . . . for those of you who recognize the striking resemblance between W1HDQ, QST's V.H.F. Editor, and KH6HAA, Hawaii winner shown here in garb characteristic of our newest state.

May 1960





Pinpointing another choice DX find is (now) K7INE, who as a Novice, KN7INE, lead all other Novice scorers in the country with 28,000 points. Bob comes from a long line of hams with his dad as K7IND and brother KN7KFW. Rig consists of Viking II, HQ-170 receiver, and homebrew cubical squad up 60 feet.

The quaint missions and the cry of gold at Sutter's mill focuses our attention on sunny California where San Diego's W6ZVQ led the state with 211K. In the meantime rockets were firing across East Bay as W6KG and K6QHC were both striving to be on target . . . the winner W6KG with 181,588 by 995/73 to K6QHC's 176,931 via 970 contacts likewise in 73 sections. By the way, WV6DNM (age 12) posed this question: "I wonder if I'm the youngest ham to go over 3000 in the SS?" A resounding negative reply comes from Texas' 10 year old, and three year SS veteran K5LWL at 57,340 points!

Amongst the craggy Rocky Mountains first ascended by Rogers and Clark, to the shores of the Great Salt Lake first spied by Brigham Young, to the Columbia Plateau, battle royals were taking place. Not only were two stations

closely vying for a section bouquet in Seven-land, but sometimes as many as three or four stations were entangled at the head of the list. Topping all the Sevens was Washington's W7HMQ with 205,313 with 1125/73; W7YGN drove home a close second with 201K. Oregon winner W7JHA with 120,420 had to beat out K7BBB with 119,458 with W7TDK trailing a close third with 114K. Arizona nearly ended up in a three-way dead heat: K7IDI with 104,300 points, however, bested W7UMS with 101,430 and W7ZMD at 100,555. Races like these can leave the log checkers with ulcers.

Moving over to the Great Lakes, region of the French and Indian Wars of yesteryear, offers no letup. W8LQA retained his Ohio crown with 186,059, but W8QHW or W8IBX nearly dethroned the Ohio king this year. Gasp! The Buckeye state winner: "With such strong Ohio competitors as young W8QHW and younger W8IBX coming up stronger each year, I don't know just how much longer I can hold out." Over in Michigan K2SIL keyed the W8SCW rig to 119,595 points to nose out would-be winners W8PXA, W8APN, and W8DUS, the latter courageously attempting to win without the low power multiplier.

The explorations of Father Marquette draw our attentions to Nine-land, where a stellar performance was registered by W9IOP. Larry's peerless performance netted him 1336 contacts in all sections to score 243,056, an all time high Sweepstakes mark, crashing his own record set in 1957 as W2IOP of 236,246 and 1298 QSO's. Thus a new contact record . . . a new scoring record in the 1959 SS! But Larry's gold ring achievement will be up for grabs in next year's merry-go-round. Incidentally W4KFC also broke the old W2IOP record. Meanwhile up north, Wisconsin's W9RQM brought home the bacon for the 14th year in a row. How many logged K9IND as Indiana? Nope . . . it's Illinois!

The scene next shifts to the Badlands, the Black Hills, the Grand Canyon, and the sod of the Midwest. W9CDP led the Colorado contingent as well as all the Zeroes. Newcomer K0SLD placed high quickly and might prove formidable opposition in years to come . . . score: W9CDP 200,750 and K0SLD with 160,600.



W1AQE	K9CIO	W3WJD	W6KG	W8ZJM
W1CWX	W3DBX	K4BAI	W6NKR	K9ELT
W1DDF/1	W3DQG	W4BTO	W6PUZ	W9FDX
W1EOB	W3EIS	W4CVI	K6PXQ	W9IOP
W2AYJ	W3FYS	W4DQS	K6QHC	W9JIN
W2BEX	W3GAU	K4GSU	K6SXA	W9KXV
K2CPR	W3GHM	K4IEX	W6TIT	W9LVR
K2DGT	W3GRS	W4IAT	W6YK	W9QYM
W2EXB	W3HHA	W4IJJ	W6ZVQ	W9RQM
W2FZY	W3HHK	W4KFC	KL2CDF	W9WNV
W2HMY	W3IYE	K4LPW	W7HMQ	W9YFV
K2MWK	W3JNQ	W4LYV	W7YGN	W9ZAB
W2QZE	W3KFP	K4PEG	K3DEO	W9BTD
W2SSC	W3KT	W4RQR	W8DWP	W9CDP
K2TIY	W3MCG	W4ZKU	W8ETU	K0SLD
W3AHX	W3MFW	W5YDC	W8IRX	W9AIIH/VE3
W3ALB	W3MSR	K6GCF	W8LQA	VE3DRC
W3BES	W3QMZ	W6GEB	W8YPT	VE7CE
K3CBQ	W3TMZ	K0GLC		

Anybody get tangled up on W0CDP and W0DCP? Big Mo entrant W0BTD scored 73² (73 sections in 73 contacts). And latest word is that K0SCM is not . . . an SCM I mean.

The Royal Mounties set the tempo for the action north of the border. Particularly hard scrounging up this year were VE5, VE6, and (whew!) VE8 . . . a late hour appearance of VESTO and VE8NH saving the day for many SSers. Nomination for longest call goes to W0A1H/VE3, as well as nomination for top Canadian score with 154,851 points. Kudos to the "Rev" for struggling with that ungodly elongated call to 850 QSO's plus the clean sweep.

NOVICE CERTIFICATE WINNERS

KN1KPA	WV2FYE	KN4MPE	KN9RFW
KN1LXB	KN3HPG	KN5TST	KN9SRR
KN1MEM	KN3HSO	KN7INE	KN0SQO
WV2EFN	KN3JGJ	KN8NHC	KN0UYO
WV2FVQ	KN4JGV	KN8OMO	

Representing our baby state to the North, Alaska, was KL7CDF . . . like if you missed him you could hardly nab that nifty multiplier. Hawaii, gem of the ocean and our newest state, was captured by KH6HAA with 79,696 points. Regarding Katashi, W8SS penned: "When KH6IJ/1 called me (he seemed to be answering CQ's and not calling CQ himself), it rather threw me, for I copied his call in error as K5BIJ/1 and it wasn't until after we had exchanged messages that it dawned on me with whom I was in QSO." The West Indies were represented by KP4AOO, although many a SSer had to rely on KV4AA for their lone W.I. contact. Another "toughy" Canal Zone found KZ5TD handing 'em out and inking in his log: "I had to stop several times to explain GMT, as well as give a geography lesson as to the location of the Panama Canal Zone. It was a real pleasure representing my zone in a small way."

Packing Dakota Derringers in their operating satchels are these two section winners. Left: Posting victory in No. Dak. was 16-year old K8IVQ with 75,400 points; station control unit on right is home design and brew. Right: Meanwhile, in So. Dak. W8SMV paced the field. Active in radio since 1934, Dale once was a communicator with the Civil Aeronautics Administration in Nebraska, and his Chief was none other than W4KFC!

As phonetics imply phone, and this concludes the c.w. highlights, we're reminded of next month's phone and club totals sequel by these phonetics concocted for his own call by W2PAZ: "Pretty — Awful — Zscore" . . . as tents across the gritty desert collapse from excess hot air!

Soapbox

"I trust those who asked last year, 'Where was W9IOP?' have been answered satisfactorily." — W3GYP. . . "The transmitter power supply blew up the first Saturday, crippling my effort the first week end. I built a new supply

and had a fine time the second week end. This was the only time Murphy came knocking and that was enough." — K3BYX. . . "The dash delay in my electronic keyer would occasionally stick after the keyer got hot, and found myself tacking zeroes onto my low numbers. Believe a couple of fellas fainted when they heard the resultant high numbers." — W3HRE. . . "I put up a two-clement beam described in QST and found that it works FB." — KN3JYD. . . "I just couldn't pull some of the gang through the noise of our movie projector which operated extensively the first week end. Toughest sections seemed to be



VE8, Wyoming, Maritime, and KL7, hi." — KL7CDF. . . "This contest really improves your c.w." — W7JHS. . . "No break-downs in equipment, just the operator." — K7INK. . . "High points of the contest for me were when VE3DRC said I was his 73rd section and when I worked W1IUU in New Hampshire for my 50th state." — K7DAS. . . "Those traditionally 'rare' sections came slowly; most elusive of the sections from here were KZ5, with KZ5TD on 28 Mc. being the only one heard, and Maritime, with only one VE1 and VO heard. VE8NH and VESTO were a welcome pair on the last evening of the contest." — W4KFC. . . "Simple arithmetic tells me I'd have a better score with 1000 QSOs in 70 sections than with 600 QSOs and 73 sections, but every year my will-power fails me, and I waste time looking for the rare ones. Guess that's just one of the things that makes the SS the SS." — W4DVT. . . "Sure a feeling of accomplishment to finally get all 73 sections." — W4JUU. . . "Bands





"Talk about Murphy's Law—Mesirov's (W3JNQ) makes the Irish look like a piker. The first time I changed bands, I lifted the main control switch, but the mercury relay in the primary lead to the transformer didn't open, grounding the 8-plus. The overload relay didn't open, and the circuit breakers didn't open and after about 30 seconds the entire rig and power supply went up in a blaze of smoke and sparks. The interlock saved my life. After getting the rig running again, the foam from a coke bottle completely covered my cross-check leaving it a sticky mess and Jersey tomatoes, among the juiciest in the land, graced my log sheets after I tried eating a sandwich."
—W3JNQ.

sounded like a million loaded bumble bees."—K8HID
... "Greatest contest ever! What happened to Wyoming, Montana, and Idaho? Never heard any stations there! Took three years to work WIAW but finally did it."—K2BIG.
... "The SS was great; I picked up two new states and a soggy pizza which fell on the floor in my excitement."—W4EKE.
... "I spent more time on the road looking for replacement tubes than I spent on the air."—K2MMW.
... "The XYL K9OAK/2, not only got the coffee but did some fine bug twisting too."—W00WY/2.
... "Sure was sick when KL7CDF disappeared under my nose."—W42GWF.
... "Worked four W7s and all of them were Utah, hi."—W4EE.
... "It took a half hour to land VE8TO."—K2QYL.
... "Never again with a broken arm, I hope."—W42DPT.
... "A twenty-one story skyscraper just to the east of my two and a half story residence certainly didn't help me very much."—W9VPZ.
... "I gave up and went squirrel hunting."—K9OPF.
... "Had a real riot in SS this year; managed to complete WAS."—K9LIO.
... "Boy, the fan I put behind the transmitter sure kept it cool as a cucumber."—K9TYM.
... "First week end a screen resistor blew in the power supply; the second week end my vee beam became a long wire when an ice storm took down one leg; and then the receiver went haywire. SS still can't be beat though."—K5ABV.
... "With three different coax leads to change, heavens knows how many VE8s were lost."—W1NJL.
... "Would be interesting to know how many contacts were made during the contest. Never heard so many stations with numbers over 500 before. Bet it would approach close to a half million contacts."—W7KEV.
... "Is Mississippi still in the Confederacy?"—W4GHR.
... "It must be merely coincidence that nobody east of the Sierra Nevada answers weak California stations unless there is a contest going. During Sweepstakes my ninety watts mysteriously was heard for the first time in Washington, D. C., Idaho, and (f) New Hampshire."—K6TIP.
... "New electronic keyer worked like a charm although the operator wasn't too adept in its operation. I missed all Saturday the second week end because of a real rocking party. Conditions were great and record breaking performances are to be expected."—K4JEX.
... "Thought this SS was the best so far, but what happened to the KZ5s?"—K4MWB.
... "We operated under simulated emergency conditions two miles from our home location in a garage on a nearby hillside farm. All cooking was done in the open and all sleeping in the hay loft."—W1IPN/1.
... "Recognized a lot of familiar calls previously worked as W6JRH in past contests."—K1CXP.
... "I really got a big bang out of my first SS."—KN1JTL.
... "Believe it or not, I can see Indiana from my QTH, but went through the first week end without one QSO with Indiana. Finally worked W9ILL in Indiana for my number 508 and 71st section. Was Indiana boycotting the SS this year?"—W4CVI.
... "The usually hard-to-get KH6J was much easier than Eastern Florida. Although KH6J was notably absent on my receiver, again for the second year KH6HAA came to my

rescue."—W8APC.
... "Introduced my son to Sweepstake by multi-op setup with him; he did O.K. for first try."—W8ZJM.
... "Probably last SS at this QTH; returning to KL7 land."—W8IZS.
... "I saved bother by turning on electric clock at same time as receiver for time on tally."—K8EWI.
... "All contacts with a straight key, wow! Bug next time."—W8ZL.
... "CU next year with a padlock on my door from the inside; then there won't be any interruptions."—W8KTR.
... "I was quite doubtful last summer if I would ever be



During SS this neat and spacious station was crammed with a Viking I, Ranger, and HT-32, and three separate bugs with all rigs on different bands . . . instantaneous bandswitching you know. Slouching down in the operating position is W1MHF, who led Connecticut with 180,000.

able to get in SS, as I was in bed with a serious blood condition. I thank the many St. Louis area hams, especially W8ZQV, who made it possible equipment- and morale-wise for me to take part. Interesting points for me: 1) A UA1 came back to me on a CQ SS on 15 meters. I missed his section, hi. 2) A KN4 came back to me on a CQ SS on 40 meters. Unusual? Well, I was on 7040 kc. . . nuff said."—K9CHE/0.
... "Suggest we adopt a new Q-signal for 'we have QSOed previously.'"—K4RJM.
... "My first SS since 1947. I set out to see what I could do with a one-band (7 Mc.) rig with low power and indoor antenna. Average per hour was too low for winning score, but believe this hand best for one-band operation. Almost everyone passes through forty sometime during the contest. Thanks for the Operating Aid No. 6. It was indispensable and I was surprised at the number of calls that can be entered on it

with plenty of thank space left. Passing comments: Local youngster K0QCQ, recent graduate from Novice band, running ahead of me, exchanging number 89 for my 63. Ole maestro W9IOF, running about 50 per hour when contest nine hours old. W4KFC running little behind him. One-way exchange with VE1RW for 60th section. Raised KZ5TD about same time but claim jumpers clobbered me out of him. Very enjoyable fracas, and I'll see you next year, if all the powers that be are willing." — W0KCG. . . . "Was rock bound using only one crystal for this year's contest, so was actually forced to call CQ 88 rather than going out lookin'. It's fun anyhow." — W0BYH. . . . "Operated mobile with gasoline consumption three gallons or 25 points per gallon." — W4ORB/4. . . . "After two week ends of 88, how do I explain to my girl friend that I love her more than ham radio?" — W8RVZ. . . . "Next year I'll pack the family off to Siberia, lock the windows and doors, disconnect the telephone, and really go to work on the old Sweepstakes." — KN800S. . . . "Extrapolating from my present curve of improvement, I might break 100,000 by the age of 103.5." — W0USP. . . . "Man, was there QRM. I didn't think there could be so many hams on one frequency. I suggest a multiplier of 100 for the one hand one crystal Novice." — KN0VQM. . . . "The power supply on my v.f.o. went to the Happy Hunting Ground, and I dosed through several physics classes, but at least things went better this year than last when I was a Novice the first week and a General the second." — K9QBP. . . . "Can you imagine the thoughts of foreign hams, especially those behind the iron curtain, when they hear the bedlam caused by the 88 contests?" — K9GZP. . . . "My first 88 contest was in 1954 as a Novice and have competed every year since. Twice was fortunate to win the Missouri sheepskin." — W0TDR. . . . "Was shooting for 1000 QSOs, but had to work most of Sunday the second week end keeping me to 32 hours operating time." — K4CFD/4. . . . "Commenced preparing for 88 early and put up a tri-band beam, 420 foot long wire, and dipoles for 80 and 40. A CQ wheel is employed as well as a W9TO electronic keyer." — W4DQS. . . . "As the plot of ground here is small, I put up temporary antennas for 40 and 80 during the 88, then take them down after the contest is over. I do so much work getting ready for 88 that the contest itself is an anti-climax. I just bought an acre of ground on a hilltop though, and look forward to an antenna farm which will stay up all year 'round." — W2HDW. . . . "The transmitter is homebuilt and designed to be used in conjunction with a 75A3 receiver. The receiver v.f.o. is fed to the transmitter to permit tracking between the transmitter and receiver. Bandpass filters are used on each band and the power amplifier circuits for each band are independently tuned. Bandchange is thus accomplished with a single switch with no retuning necessary. I feel that these two features contributed materially to my score in the 88 and reduced fatigue." — K0CEP. . . . "Thanks for a really big contest! Saw a lot of my old friends and enemies too. I didn't do so good. Matter of fact, I did lousy. One thing for sure, I'll do better next year, for I can't do much worse." — K4PYM. . . . "I must admit I don't particularly like 88, but I'll be back next year with more time and a better score." — KP4A00. . . . "More QRM than ever before, but not from VE1, VE8, or So. Carolina!" — W6SRT. . . . "Just about gave up getting Canal Zone, but he finally showed up on 7 Mc.; guess this is the first time I have ever gotten all 73." — W6NKR. . . . "Big kick was when a UA3 answered my CQ 88 and offered a number. What section is Moscow in?" — W9CDP. . . . "By increasing my power 300% to 75 watts, I was able to increase my score over last year by 676%. Boy, the difference of 50 watts!" — W6UFI. . . . "Confined to 40 meters but was surprised with some of the sections I came up with on the 50 watt rig to an eight foot high antenna." — W4GCPM. . . . "I am in favor of a 1.75 multiplier for those, like me, who have to study for quarter final exams on 88 week ends, and a 75 multiplier for those who called 'CQ 88' longer than three times." — W6JLO. . . . "My first 88 since changing my call from W4SAT. The 88 gang made the most of 28 Mc. openings; was surprised to total 118 QSOs on that band. Suggest that next year's 88 announcement stress the availability of ARRL Operating Aid No. 6. I lost quite a bit of time the second week end being called by stations I'd QSOed before." — K7IDI. . . . "My code speed went up at least 10 w.p.m. over the four days operating." — K7GTC. . . . "I do not expect to



Here are a couple of "rare birds" if ever. Bottom shows KL7CDF who has blown up quite an operating storm in Alaska in 88 and other operating activities. Top captures KP4A00, who handed out that must W.I. multiplier to the gang. Roger much prefers the DX Contest, but expects to be back next year. If you missed either of these two, your hopes of making the clean sweep were greatly shattered.



participate in future 88, unless something changes to make it more attractive. My thanks to W1AW for a contact in the 88." — K7IKT. . . . "Man, what a mess! Real glad to work K0PVI for first Colorado, KH6CJJ for first Hawaii, and W3DRD for first Delaware." — W6DNM. . . . "I don't know if I should report my score as multiple operator. Does a Tweetybird Parroquet trying its best to devour the log sheets constitute multiple operator? Those are the birds nibbling, not me. I did my gnawing on my pencils and used up about a gross and never even tasted a one." — W7POU. . . . "Wow! Sure a big difference between 88 and the Novice Roundup." — K7DVT. . . . "Just a word concerning the great American pastime, the 88. It sure is a real test of the gear, and the operator of course. When I blew the 6146 in the final, a few disaster calls to local hams netted me some spares." — WV2FFC. . . . "I had a most unwelcome visit from the in-laws the second week end. Note — a balanced ham puts family first, even in 88 (though it may hurt a little)." — K2MBD. . . . "Glad to help many of the boys complete WAS, for South Dakota is one they sure do need." — W6SMV. . . . "My shack has been improved over the years to the point that little can be done to improve score by improving equipment. My small increase over last year bears this out. For a decent antenna, I would have given up my nice roomy



SS is not kid-stuff to these deans. Left is New Mexico winner W5CK, with such honors coming right in stride now after SS victories in '57 and '58, and DX Contest scrolls for the last two years. Below is W1QMM, who hands out coveted Vermont QSO/L's. After having come through for several contest certificates, the old faithful 813 transmitter has since been torn down for this RK-65 amplifier.



operating table, the 80-meter band, my only Idaho QSO, the considerable investment in operating 'extras', and a 75A-4, had I one, hi"—K2MWM. . . "Last SS I worked, I was in the South Minnesota section!"—W0KUI (Only you OTs will remember that.—Ed.). . . "Many thanks for peachy-keen type SS, as usual. With full 150 watts and 39 hours this year, made twice last year's score. Overall operating proficiency was good but was aggravated at number of attempted duplicate QSOs. One W2 tried to work me three times in less than a half hour!"—K2UJZ. . . "Almost twelve times the power input this year over last year for a net loss of 12,000 points. This QRO stuff doesn't pay! Found that no cigarettes and 'way less coffee this year left me feeling a lot less dragged out after this contest than any previous. I'll be back next year with my old 807 for even more fun. This was the best ever and I especially was gratified by the new crop of FB c.w. operators."—W2W0E. . . "Whoever picked the date of 3 Dec. for reports to be postmarked is no contest man! By the time I realized that they had to be in that soon, it was too late to get my log all copied. I've operated contests for twelve years and don't remember having to mail results this quick. Hope you'll be more considerate in the future."—W2WZQ. . . "I could see a considerable improvement in my operating technique just over one week end. Here's for more and better contests."—K2YMM. . . "Of all week ends to get sick. . ."—K5QNP. . . "My first real SS, was out on a friend's roof with no hat on all afternoon. After sitting at the rig until 0300, I got a terrible neck and back ache. My AT-1 maintained a 11 QSO/hour rate."—K3GHH. . . "This is about my twentieth SS and I still get a big kick out of them. The operating techniques have sure improved over the years."—K4LPW. . . "It's sure hard to stay awake in classes on Monday, hi."—K4PHY. . . "Don't want to use old standby remark: 'Wait till next year.'"—K5QNE. . . "Really enjoyed SS even with 50 watts, crystal control, low antenna, regenerative receiver, with 40 meters oil on one spot on the dial, and alarm clocks that failed to function. I now quote ancient, and I mean ancient, Confucius saying: 'Wait till next year.'"—K3JZD.

C. W. SCORES

Twenty-Sixth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . The operator of the station first-listed in each Section is awarded winner for that Section unless otherwise indicated. . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . A indicates power up to and including 150 watts (multiplier of 1.25, c.w.), B over 150 watts (multiplier of 1). . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . Example of listings: W3JNQ 232,688-1275-73-A-39, or final score 232,688, number of stations 1275, number of sections 73, power factor of 1.25, total operating time 39 hours. . . An asterisk denotes Novice certificate winners in sections where at least 3 Novice logs were submitted. . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3JNQ	232,688-1275-73-A-39
W3BES	220,095-1206-73-A-40
W3ALB	207,503-1137-73-A-40
W3MFW	197,283-1081-73-A-37
W3GIM	188,790-1032-73-A-35
W3HHK	184,325-1010-73-A-39
W3CPS	177,944-1044-71-A-40
W3WJD	165,163-908-73-A-38
W3KFT	150,745-826-73-A-39
W3DQC	148,008-811-73-A-40
W3MWC	133,391-764-71-A-38
W3HHA	131,035-718-73-A-39
W3KFT	129,758-711-73-A-39
W3NOH	126,203-711-71-A-27
W3ARK	126,000-900-70-B-37
W3JSA	122,570-721-68-A-40
W3GYP	122,130-713-69-A-38
W3BB	119,850-705-68-A-35
W3EAN	107,200-643-67-A-39
W3WKC	106,875-605-70-A-24
W2SOH	102,340-602-69-A-40
W3MDO	102,833-625-71-A-38
W3DBX	91,615-602-73-A-37
W3EWW	91,080-506-72-A-37
W3YU	91,035-570-63-A-39
K3ALD	90,015-630-68-A-31
W3ISE	89,375-650-65-A-35
W3QML	89,279-614-73-B-37
W3RDF	84,028-551-61-A-25
W3GRS	83,950-460-73-A-28
W3IXN	74,873-447-67-A-33
K3DPQ	70,875-451-63-A-40
W3ADE	70,403-447-63-A-30
W3EFY	69,878-426-66-A-38
W3GSD	67,735-437-62-A-40
K3DKO	59,850-402-60-A-27
W3ITZ	57,915-450-52-A-35
W3KVQ	55,420-326-68-A-20
W3BYN	53,248-361-59-A-32
K3BRE	49,790-383-52-A-40
W3EJA	48,668-311-63-A-14
K3DFK	48,283-333-58-A-38
W3DVC	37,688-336-45-A-20
K3DXN	37,620-270-56-A-36
W3WHB	36,388-355-41-A-29
W3NHX	35,910-252-57-A-34
W3C88	34,788-253-55-A-10
K3GJO	34,150-250-56-A-19
K3ANU	33,800-255-52-A-16
W3UPU	33,125-265-50-A-40
W3CLM	32,313-235-55-A-27
K3CRO	28,620-238-50-A-23
W3FHR	27,810-206-54-A-22
W3TPC	27,365-211-52-A-15
W3AEM	24,238-217-56-B-17
K3GJO	24,150-231-42-A-13
K3EGE	24,045-229-42-A-22
W3DAO	22,620-232-39-A-40
W3CNS	22,138-191-35-A-19
K3HON	21,620-206-42-A-38
W3C88	20,925-155-54-A-12
W3NCW	20,720-148-56-A-21
W3ADZ	20,561-231-62-A-9
K3BPL	20,500-164-50-A-16
K3HIA	20,090-201-41-A-35
W3DFJ	19,920-166-48-A-23
W3BFR	19,200-200-48-A-19
K3HIA	19,030-173-45-A-25
W3DVF	14,245-154-37-A-8
K3GOO	12,750-174-30-A-18
W3HNE	12,458-151-33-A-1

W3LEZ	10,823-117-37-A-3
K3JGJ	9600-128-30-A-36
W3FXK	8796-114-31-A-17
W3JXS	8775-90-39-A-5
W3ZON	8190-117-28-A-15
W3QKV	6900-115-24-A-10
K3GJQ	6105-112-22-A-19
W3VCP	4860-54-39-A-5
K3ALL	4350-87-25-B-8
W3IMN	4200-60-28-A-9
K3GEM	2800-80-16-A-20
K3ENV	2025-54-19-A-8
K3KHT	1418-33-18-A-7
W3GHD	1260-28-18-A-2
W3NFI	1120-40-14-B-2
K3JUG	388-19-10-A-5
K3DVS	245-14-7-A-1
K3JSP	180-9-B-A-2
W3AWD	5-2-1-A-
K3ALU	5-2-1-A-
W3AHX (W3e AHX GOQ)	101,653-557-73-A-39
K2EVW/3 (4 ops.)	23,750-250-38-A-24

Mid.-Del.-D. C.

W3JEL	224,840-1232-73-A-40
W3GAA	192,096-1006-73-A-40
W3MSR	170,090-1165-73-B-40
W3IYE	163,064-895-73-A-37
W3JEL	158,501-899-73-A-39
W3GRF	154,000-1006-73-A-37
W3TMZ	147,314-1006-73-B-36
K3CIC	146,821-805-73-A-38
W3AEL	143,310-843-68-A-26
W3MFI	142,012-812-70-A-38
W3VAN	135,072-940-72-B-31
K3GUR	135,000-750-72-A-32
W3MCG	115,158-634-73-A-40
W3KA	109,883-637-69-A-34
W3JTC	108,675-650-67-A-33
W3DRD	108,360-602-72-A-30
K3JQU	104,280-636-66-A-26
W3RNY	89,978-586-62-A-36
W1KGG/3	88,740-523-68-A-35
W3FRZ	84,240-527-64-A-39
W3IKN	82,005-497-66-A-35
W3KDP	80,160-501-64-A-36
W3HVM	73,663-415-71-A-30
K3ANA	68,750-500-55-A-27
W3KYN	65,638-447-59-A-36
W3IWI	63,944-447-59-A-36
W3HQC	61,100-378-65-A-22
K3APM	56,482-466-62-B-34
W3KHU	51,539-307-67-A-27
W3KDD	47,438-275-69-A-36
W3KLA	45,698-339-54-A-11
W3UPE	43,865-283-62-A-25
W3KYN	39,606-306-44-A-25
W3KZQ	37,938-304-50-A-34
K3DAZ	35,643-269-53-A-21
K3BHR	35,190-395-45-B-40
W3ZQA	33,038-319-55-A-14
W3WLO	33,000-240-56-A-25
K3ICY	31,200-213-60-A-36
W3BKE	29,412-298-57-B-16
W3JQ	28,536-151-65-A-17
W3QC	18,424-167-47-B-21
K3CXX	18,281-190-39-A-18
W3YAG	17,290-172-50-B-18
W3ZQA	15,038-319-55-A-14
W3HRE	13,778-167-33-A-20
W3TN	13,775-145-39-A-16
K3HPG	9818-121-33-A-23

K3EKL .6004- 107-15-A-12
 W3EPR .2548- 46-28-B-6
 K3JIX .2058- 43-21-A-12
 W3HFO/3 .1888- 33-22-A-9
 W3TNG .3850- 40-12-A-10
 K3JIT .3855- 15-11-A-18
 W3PEV .180- 9-8-A-2
 K3JDI .105- 7-6-A-1
 W3HOF .3850- 65-27-B-17
 W3FYS (W3FYS, W3HOF)
 108.265- 922-73-A-37
 W3WV (W3 PZW WV)
 172.950- 1023-69-A-40
 W3PZW (W3 PZW WV)
 41.745- 253-66-A-24
 K3JYD (K3JN IZE JYD)
 3850- 65-27-B-17
 W3EAX (W3 YTW ZGN)
 3000- 60-20-A-4

Southern New Jersey

W2SHDW .175.950-1023-69-A-40
 W2SHM .146.200- 860-68-A-38
 W2EXB .132.313- 725-73-A-38
 W2QZE .128.024- 703-73-A-38
 K2ERC .115.138- 703-73-A-38
 K2CFR .109.865- 602-73-A-38
 W2QDY .108.500- 620-70-A-38
 K2BZK .98.490- 588-67-A-40
 W2BLY .73.000- 410-12-A-10
 W2DAJ .63.375- 300-63-A-38
 W2FYS .62.155- 402-62-A-39
 K2BWH .60.938- 376-65-A-38
 W2ILN .58.048- 375-62-B-17
 W4HBO/2 .54.574- 347-63-A-17
 W28DB .51.520- 322-64-A-25
 K2MIV .44.008- 306-58-A-38
 K2KMH .31.600- 240-53-A-38
 W2LY .21.250- 170-50-A-8
 K2JXX .21.016- 197-43-A-10
 W2KXR .20.625- 150-50-A-16
 W2IZS .17.500- 250-29-A-10
 W2REB .16.800- 140-48-A-15
 K2AIM .12.690- 141-45-P-24
 K2QWM .12.145- 176-28-A-13
 W2NGV .96.000- 95-11-A-11
 K2BG .92.15- 97-38-A-8
 W2BUI .91.800- 108-34-A-10
 W2APD .71.31- 84-35-A-12
 W2VIM .68.800- 84-35-A-13
 W2PAZ .65.000- 100-26-A-10
 W2NRJ .64.35- 96-39-A-10
 K2IHW .58.75- 94-25-A-10
 K2GSI .57.000- 70-27-A-7
 W2HJD .45.50- 70-26-A-27
 K2SJL .44.28- 77-23-A-16
 W2PFC .42.81- 70-23-A-20
 W2BRI .40.50- 54-30-A-10
 K2MBD .30.50- 61-20-A-8
 W2VCX .12.15- 28-18-A-8
 W2PAU (W2 LPAU)
 111.038- 639-70-A-31
 K2RVE (K2A DNA RVE)
 79.902- 584-60-B-40
 K2MNZ (K28 MNZ WV)
 3000- 60-20-A-15

Western New York

W2AMWK .191.443-1049-73-A-34
 W2BHE .156.585- 858-73-A-39
 W28SC .131.100- 721-73-A-29
 K2MWM .125.400- 763-66-A-39
 K2UJZ .120.360- 708-68-A-39
 W2WOL .91.140- 652-70-B-34
 W28SX .85.500- 524-67-A-31
 W2MTA .85.700- 512-67-A-31
 W2CJO .65.663- 390-65-A-31
 K2ADY .51.383- 403-51-A-26
 W2DGG .46.406- 345-45-A-21
 W2KKT .45.725- 310-59-A-27
 W2ANA .45.150- 306-60-A-27
 K2PKK .41.202- 328-63-B-38
 K2UFC .37.800- 236-45-A-18
 K2VRD .29.705- 292-41-A-17
 W2DISC .24.675- 210-47-A-20
 W2IOL .18.454- 203-37-A-19
 W2EMW .17.665- 157-45-A-14
 W2TOP .15.640- 137-46-A-15
 K2QDT .15.405- 158-39-A-9
 W2WZQ .15.320- 205-33-A-9
 W2HQH .12.150- 122-40-A-37
 W2OMV .10.115- 145-28-A-12
 W2ACEL .9.755- 130-33-A-26
 W2OPV .9.251- 140-27-A-10
 K2PKL .81.20- 85-36-B-11
 W2ZCZ .42.75- 86-25-B-6
 W2KAT .39.00- 65-30-B-6
 K2CWN .36.40- 65-28-B-4
 W2KEC .28.75- 50-23-A-3
 K2HVS .17.33- 34-21-A-6
 K2YMM .9.56- 26-15-A-10
 W2RFQ .2.50- 10-10-A-1

Western Pennsylvania

W3GJY .105.840- 588-72-A-34
 W3YDK .105.455- 598-71-A-34
 W3EAO .88.200- 490-72-A-34
 W3UGV .85.225- 487-70-A-32
 W3IJA .60.375- 413-60-A-30
 K3GHH .51.145- 386-53-A-40
 W3NUY .47.046- 349-54-A-28
 W3ZEG .42.525- 315-54-A-24
 K3BBJ .39.625- 330-50-A-38
 W3NRE .38.088- 277-55-A-38
 W3KOD .32.50- 210-49-A-19
 W3AVY .31.644- 208-61-A-28
 W3LMM .25.380- 235-54-B-10

K3HTJ .19.458- 182-43-A-16
 W3JHT .18.988- 144-54-A-12
 W3EWF .16.750- 136-50-A-22
 W3IYL .13.200- 160-33-A-15
 K3JID .12.400- 135-28-A-20
 W3JHG .5340- 91-24-A-21
 K3CMC .4185- 93-18-A-8
 K3HJL .3738- 50-26-A-9
 K3HRS .4885- 33-23-A-23
 W3IDO .2700- 50-21-B-6
 W3JW .2214- 41-27-B-4
 W3DKL .1360- 32-17-B-4
 K3JIZ .1218- 29-21-B-5
 K3JHH .7878- 23-17-A-2
 K3HWT .829- 20-17-A-2
 K3CAQ .653- 36-9-A-9
 W3JHO .4885- 19-12-A-12
 K3HBTM .131- 8-7-A-4

CENTRAL DIVISION

Illinois

W9YFV .210.605- 1154-73-A-40
 W9IRH .194.580- 1087-72-A-40
 W9WNV .180.920- 1054-72-A-37
 W9ZAB .179.070- 932-73-A-38
 W9INQ .168.448- 949-71-A-40
 W9FV .160.900- 932-73-A-38
 W9RCJ .162.270- 902-72-A-40
 W9NFC .161.170- 910-71-A-40
 W9HJL .148.281- 817-73-A-37
 W9YTY .127.800- 720-71-A-12
 W9VZF .121.055- 682-71-A-35
 K9KYR .119.458- 673-71-A-35
 K9IMY .119.170- 702-68-A-39
 W9WYD .109.800- 613-75-A-35
 K9IND .108.875- 650-67-A-40
 W9QOQ .106.165- 628-68-A-38
 W9IBZ .100.300- 602-62-A-38
 K9BYV .100.000- 602-62-A-38
 W9CLH .93.968- 565-67-A-40
 K9KWK .90.100- 530-68-A-35
 K9MAR .82.440- 523-64-A-39
 K9KDL .76.500- 540-57-A-28
 K9SP0 .75.525- 530-57-A-40
 K9JMA .69.630- 428-66-A-30
 K9JBT .65.538- 377-70-A-19
 K9JTG .60.800- 403-62-A-23
 K9JLJ .59.313- 375-65-A-26
 K9HIN .58.590- 434-54-A-35
 K9KJL .57.885- 454-51-A-36
 W9NLF .56.669- 90-26-A-40
 K9OVI .55.200- 346-64-A-33
 K9DJQ .54.300- 365-60-A-22
 K9OKD .53.500- 325-64-A-21
 W9AGM .51.000- 300-68-A-16
 K9LOK .48.285- 334-58-A-29
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 W9YAC .5.460- 91-30-B-19
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 K9KNT .35- 4-4-A-1
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 K9OFP .10.388- 130-34-A-16
 K9NCG .8.000- 80-40-A-7
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 K9NFTC .7.663- 95-34-A-30
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 W9RKP .74.900- 428-70-A-27
 K9GDF .72.960- 456-64-A-23
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 W9BTM .11.610- 108-43-A-9

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 W9LIR .11.350- 115-40-A-19
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 K9OFP .8301- 115-28-A-3
 K9MAS .7714- 94-33-A-13
 K9CZC .6355- 82-31-A-21
 W9LTD .5348- 94-23-A-18
 W9WUQ .5215- 79-28-A-40
 K9MKC .3575- 65-22-A-6
 W9DPN .2156- 38-23-A-8
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 W9ADI .475- 19-10-A-4
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 K9MGG .18.400- 160-46-A-25
 K9NSG .17.860- 190-38-A-40
 K9OTHE .16.497- 176-47-B-28
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 K9SEJ .5325- 71-30-A-4
 K9NJP .5038- 62-34-A-29



"In order to keep the rig cool enough to stand the grind, I opened the windows in the shack. Soon the rig was cool and the shack more so; 40 degrees! I had to wear three shirts, 2 pairs of socks and gloves (which made it hard to key). It kept the equipment cool, the shack cold, and me freezing!"—K9OFF.



Turning the tables of last year, W7HMQ walked off with Washington honors and top W7 laurels as well. Bud is also active in emergency work, being SEC for Washington and an EC/RO.

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W2TER . 47,200-321-59-A-36
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W2ZNU . 14,000-140-40-A-26
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K2IYC . 113,733-681-67-A-40
K2IAP . 107,280-596-72-A-40
W2CWO . 103,760-667-64-A-38
W2ZGW . 101,948-592-69-A-38
K2LTI . 89,700-530-68-A-39
W2MDM . 88,200-700-63-B-39
K2TNO . 88,125-560-60-A-40
K2YMO . 86,400-540-64-A-39
W2JGU . 80,240-544-59-A-39
K2CNC . 73,360-527-70-B-1-
K2CMV . 71,920-464-62-A-31
K2JQO . 68,549-454-61-A-30
W2NCG . 66,495-407-66-A-35

After winning the VE7 plaque for phone in '58, VE7CE turned right around to capture the c.w. certificate in '59. But contests are just a side light, with a DX tally of 197/178. Thirty-four hours of operating netted 92,893 points.

QST for

K2QMF .60.750-405-60-A-33
W2DUS .56.500-404-56-A-25
W2PCQ .54.747-435-63-B-27
K3ZYR .83.856-409-61-B-33
K21QT .51.000-401-51-A-27
W21NS .47.355-354-49-A-25
K2HGR .41.975-300-55-A-23
K21YV .39.150-271-58-A-25
W2DID .37.938-304-50-A-23
K2JOK .34.560-256-54-A-39
W2AFNA .31.185-255-54-A-39
W2BHQ .30.844-263-47-A-12
W2DUN .29.688-239-50-A-33
W2NFN .28.085-245-47-A-22
W2ABKC .27.900-250-54-A-19
W2WAS .26.276-215-49-A-29
W2ZEF .25.968-221-47-A-12
W2HII .25.174-210-49-A-4
K2BHB .20.150-155-52-A-14
W2AIZ .19.255-235-33-A-20
W2OBU .15.750-225-28-A-14
W2DMM .15.120-126-48-A-19
K2KHK .14.560-148-40-A-19
W2TNI .13.500-150-36-A-17
K2OHV .12.690-141-45-B-13
W2YSL .12.675-172-29-A-13
K2CQB .11.854-153-51-A-17
K2ODT .11.858-93-51-A-8
W2MUM .11.615-101-46-A-4
K2JLD .10.725-110-39-A-7
W2JHW .10.710-108-38-A-22
K2CTK .10.350-117-36-A-15
W2ZEF* .10.129-112-39-A-27
W2AAWH .9880-125-32-A-22
K2GLX .9440-122-32-A-22
W2ADWD .8000-100-32-A-2
W2BWS .7863-85-37-A-18
K2ZMB .7669-88-33-A-12
W2ABVH .5135-79-26-A-8
W2KVL .4950-60-33-A-2
K2BTT .3983-59-27-A-4
W21AL .3515-74-19-A-6
K2TPZ .3175-64-20-A-16
W2ABWM .3081-73-17-A-17
K2ZJA .2970-50-24-A-7
W2ZGB .2906-48-25-A-16
W2GPH .2760-58-23-A-14
K2JWJ .2750-50-22-A-16
K2ZS .2625-50-21-A-5
W2ZCWY .2589-55-19-A-10
W2HIE .2000-50-20-B-7
W2V8U .2000-40-20-A-6
W2ADQM .1870-45-17-A-9
W2DPT .1650-35-15-B-10
W2ZEE .1320-33-16-A-11
W2BYN .1120-28-20-B-11
W2DXXH .1000-29-15-A-14
K2IUT .870-29-12-A-4
W2UQZ .540-18-12-A-11
W2ZGGB .325-13-10-A-3
W2JGS .176-11-8-B-4
W2FEI .105-8-6-A-10
W2PVQ .5-2-1-A-2
W2ZGA .2-1-A-2
K21QA (K28 K2H U2N)
107.021-685-63-A-40
W2HII (W2HII, W2DHF)
65.775-440-60-A-38
W2HJ (7 ops)
41.925-402-43-A-37
W2QFF (W2QFF, K2VAB)
25.664-212-49-A-24
W2ZFXF (W2ZS, F2F GMB)
1211-30-17-A-7

Northern New Jersey

W2DMJ .175.500-977-72-A-38
W2OIB .162.750-930-70-A-36
W2GND .125.010-715-72-A-33
W2GGE .122.850-878-70-B-38
K2QYI .101.600-508-68-A-33
K2QQA .87.863-545-66-A-37
K2MFF .86.445-510-68-A-29
W2GRY .85.305-517-66-A-32
W2FZY .74.734-410-73-A-26
W2JHJ .71.700-410-70-A-24
W2ZBR .64.054-451-57-A-7
W2DWN .55.355-326-68-A-31
K2PLF .53.398-403-53-A-36
K2PIM .51.250-355-60-A-33
W2OPE .52.205-494-53-A-32
K2MBX .50.595-343-59-A-36
W2ZVW .42.150-281-60-A-17
W2PFS .42.895-373-46-A-28
W21RO .41.965-352-44-A-22
K2UTT .40.200-288-60-A-28
W2TPJ .38.341-415-37-A-18
W2HDT .37.000-400-37-A-26
W2QYW .36.190-330-55-B-15
W2ATH .33.863-302-45-A-40
W2ANG .28.956-254-57-B-14
K2LNS .28.885-218-53-A-20
W2JHN .28.840-207-50-A-17
W2ZXL .26.815-173-62-A-32
W2EQS .24.948-231-54-B-7
W2ZCR .18.315-201-37-A-24
W2BWW .17.825-132-54-A-8
W2IBZ .17.408-212-33-A-13
W2CVW .15.844-159-49-B-9
W2WV .15.170-148-41-A-13
W2ASNL .15.065-124-50-A-12
K2SBW .14.620-174-34-A-23
W2SLZ .14.100-120-47-A-21
W2ECO .13.860-132-42-A-5
W2ABL .13.775-145-38-A-10
W2BVE .13.500-180-30-A-13

W2ZFGY .11.933-125-39-A-16
K2ZKH .10.730-149-29-A-12
K2PEM .10.301-136-31-A-9
W2EHC .9.820-12-34-A-8
K2TEO .9.100-105-34-A-14
W2WCC .8.840-104-32-A-15
K2JHK .7.178-87-33-A-9
W2DHC .6.758-75-34-A-18
W2DPT .6.248-77-34-A-18
K2DWL .5.950-70-34-A-7
W2DAE .5.640-72-28-A-8
W2ZET .4.188-67-25-A-25
W2AFB .4.725-70-27-A-17
W2VMB .4.588-75-31-B-2
W2NLI .4.400-70-32-B-6
K2ETB .3.785-67-25-A-25
W2ZVFG .3.749-68-23-A-17
K2FTI .3.255-62-21-A-7
W2TJD .2.754-51-27-B-5
W2ZFCJ .2.175-41-22-A-32
W2ZFGP .910-30-13-A-15
W2EWC .870-29-12-A-4
W2ZCN .875-20-15-A-9
W2LWO .865-18-13-A-5
K2LSU .510-17-12-A-1
W2ZGDP .428-21-9-A-8
K2DMI .13-10-1-A-1
K2DN .158-9-7-A-2
W2MPM .120-8-6-A-2
W2ABDO .3-1-A-2
W2ZGX (W2GJL, W2ZJZ, W2ZDM)
32.724-283-47-A-34
W2ZGQZ (W2GJL, W2GQZ)
12.113-139-38-A-40

MIDWEST DIVISION

W0VXO .170.510-1003-68-A-40
W0WZD .125.125-715-70-A-41
W0CXN .115.500-700-70-A-38
W0EQN .106.323-599-71-A-39
K0OVR .95.115-572-68-A-40
K0UBD .84-25-A-16
K0AZA .78.625-467-68-A-29
K0QAI .51.545-340-41-A-35
K0JRT .48.970-343-59-A-24
K0JZB .44.055-217-46-A-22
K0UAE .33.008-260-54-A-38
K0LUP .31.556-252-55-A-22
W0USP .30.045-226-53-A-25
K0HUA .24.055-217-46-A-22
K0N8V .18.169-165-45-A-22
K0PSC .16.448-153-43-A-15
K0PTV .12.725-89-34-A-17
K0BAP .9.640-76-32-A-16
K0QWM .3.881-67-27-A-21
K0KGS .2.880-48-24-A-6
K0FTV .1.381-37-17-A-9
K0VQM .1.126-28-17-A-21
W0HNA .2.20-11-10-B-1
K0QAK .75-6-5-A-2
K0HUA .57-4-4-A-4
K0LEA (K08 DPH LFA)
100.082-556-72-A-35
W0LNI (W0DNP, K0PFI)
77.000-440-70-A-37
KN0UPO (3 ops)
2310-51-21-A-27

Kansas

W0BYV .65.772-522-63-B-33
K0HLC .53.505-374-58-A-26
W0ABW .40.930-273-60-A-26
K0QBP .38.165-228-51-A-28
K0QJG .28.420-199-58-A-19
K0PFF .23.280-197-48-A-32
W0TTO .20.458-201-53-B-17
K0IWK .17.625-141-50-A-24
W0TTS .15.334-133-47-A-28
W3WLM .04.511-125-47-A-25
K0BNE .11.044-145-31-A-10
W0CEP .6.160-76-32-A-16
W0SPE .5.100-60-34-A-11
K0GZP .4.190-52-32-A-4
K0N8W .1.75-35-20-A-17
W0JFC .293-13-9-A-2
K0VVR .8-2-2-B-1
W0QQQ (4 ops)
29.960-245-51-A-31

Missouri

W0TDR .146.300-836-70-A-40
K0CHEP
138.863-800-69-A-38
W0HIM .80.385-468-69-A-39
W0MCX .78.030-450-68-A-37
W0QWS .73.415-522-70-A-34
K0QCC .65.000-406-65-A-25
K0LXB .58.280-376-62-A-38
K0PDD .43.863-340-55-A-40
W0KCC .32.625-240-60-A-24
K0UUF .35.000-259-56-A-18
W0DCP .32.321-255-51-A-24
W0BYH .29.731-319-47-B-16
W0TDT .32.321-255-51-A-24
K0N8YO* .12.800-128-41-A-9
W0RKM .11.788-116-41-A-9
W0NLD .8.895-102-36-A-33
W0KIK .829-75-A-2
K0N8VMZ .4418-57-31-A-14
K0N8BW .3219-54-25-A-19
K0N8V .3219-54-22-A-3
K0SFF (K08 SFF TC)
18.150-184-50-B-20

K0OJC (K08 OJC 8GJ)
13.610-151-46-B-13
KN0UTN (4 ops)
4151-75-27-A-39
Nehru
W0NYU .153.790-796-71-A-40
K0ORF .107.364-785-69-B-38
W0RDN .43.388-267-65-A-19
W0QFK .40.810-310-56-A-25
K0RIG .21.180-165-52-A-25
K0SCM .15.808-152-45-A-19
W0MAO*
14.400-120-48-A-21
W0ASO .10.678-141-38-B-6
K0VPA .6270-77-33-A-20
K0QVM .5320-76-28-A-10
K0WTH .3510-60-24-A-6
K0UCH .2998-44-26-A-13

NEW ENGLAND DIVISION

Connecticut
W0HMF .180.000-100-72-A-33
W0HIF .167.738-948-71-A-33
W1AW*
147.680-1040-71-B-33
W0DGL .116.664-701-67-A-34
W0TSP .108.540-603-72-A-33
K1ACI .100.668-601-67-A-30
K1HTV .95.056-570-67-A-39
W0DVO .93.775-682-55-A-35
K1HOP .80.910-526-63-A-32
W1ILV .69.606-469-51-A-27
W1TUV .67.929-560-53-B-37
W1CHT .62.035-350-58-A-19
W1WIF .45.085-254-71-A-27
K1CSH .43.673-325-54-A-39
W1HJU .40.773-414-39-A-32
W1CTP .32.982-239-69-B-30
W1MBX .31.250-250-59-A-17
W1TXX .22.800-200-57-B-13
W1WQ .22.388-209-45-A-25
W0VGC .20.745-231-45-B-6
W1EFW .19.784-162-49-A-9
W1EQV .16.128-192-42-B-27
W1NLM .15.872-124-64-B-28
W1PST .14.112-147-46-B-9
W1JTD .10.640-76-70-B-1
W1YNC .6060-101-24-A-12
K1MOT .5970-101-24-A-19

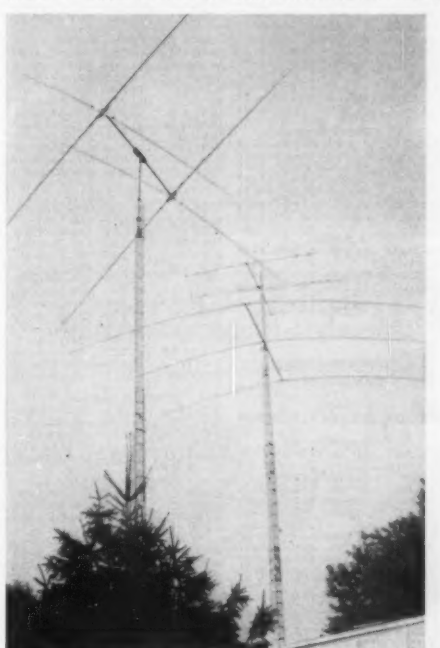
K1HJ .5376-94-23-A-14
K1KJ .5250-100-21-A-22
K1VX .4970-71-29-A-6
W1RFL .3360-96-14-A-18
W1NJA .2300-46-20-A-2
K1KPA* .2189-55-17-A-25
K1EBV .2100-43-17-A-15
W1RFL .1488-35-17-A-10
W1IKP .748-23-13-A-1
K1NJK .634-22-13-A-10
K1NLT .509-19-11-A-26
K1NMB .500-20-10-A-10
K1DMF .158-9-7-A-1
K1NJC .10-2-2-A-13
K1JG .7-2-2-A-1
W1UTP .3-1-1-A-2
W1YU (K1AN, K2CJ)
110.331-800-69-B-35

Maine

W1BCD .98.325-570-69-A-38
W1GK .97.300-558-70-A-40
K1BAZ .23.300-235-40-A-34
K1GOG .21.805-178-49-A-4
K1GVQ .9800-100-40-A-23
K1JMB .3445-57-26-A-14
K1ACR (K1A CR ACT)
38.710-317-49-A-30

Eastern Massachusetts

W176.021-986-73-A-39
W10GU .170.188-979-70-A-40
W1ROD .137.638-787-70-A-40
W1CWX .118.990-652-73-A-40
W1AQE .118.625-650-73-A-40
W1JSM .111.420-670-72-A-40
W1TW .85.680-612-70-B-29
K1CLT .81.250-500-65-A-4
K1DIR .74.348-431-69-A-37
K1BYL .71.550-540-53-A-26
K1CTD .68.168-448-81-A-36
W1HA .55.723-361-62-A-17
W1RFN .54.175-394-55-A-34
W1NJI .53.170-409-52-A-18
W1NS .44.220-200-66-A-21
W1ONP .43.753-277-63-A-28
W1RGW .40.200-335-60-B-13
W1HJP .40.000-342-59-B-19
K1XT .36.274-288-51-A-32
K1LW .35.775-270-53-A-29
W1PLJ .35.325-277-60-A-29
W1JL .34.980-212-66-A-24



Like if you gonna get out, have antennas . . . says K2DGT with this array. The quad is a homebuilt 20-15-10 affair on a 60 foot tower; in the background towers a tri-band three element "Hy-Gain" stacked over a full size three element Telrex 40 meter (I) beam. The house is thirty feet high.

(Continued on page 164)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Wheel!

Rumors of a rumble preceded our annual DX Hoggery & Poetry Depreciation Society get-together, so it was not without some trepidation that Jeeves & Co. slithered through a side door into Long Hall where a noisy crush of DX men had already gathered. We accepted schooners of Old Haywire and moved toward inconspicuous gallery seats while chairman Q. R. Emswell flailed his gavel for order. His flailing was unavailing; several more dangerous rounds of O.H. were propagated before poor Q.R. finally shattered the gavel in one mighty swing and smashed his fist with an anguished shriek. This worked. The meeting came to order as chairman Emswell, really only *pro tem* anyway, crawled away sobbing. A few by-pass cadenzas of our beloved Wouff Hong Song followed, and Dimiter Pinner began the 1960 DXHPDS orgy with this intro:

We no longer need be annoyed
By mental case Ace Moygatroyd.
With faked QSLs
He outworked his pals —
His DXCC now is void.

Then it was Exeter Classlid's turn, and he came through ignominiously:

The nastiest pest with a call
Is U. Gottaworkme O'Paul,
Whose kilowatt treads
On rare ones' home skeds
Till they won't work Yankees at all.

Ernest Jammer next rose to the rostrum amid rumblings that sounded strangely like heavy machinery moving about. Ernie loudly declaimed the demise of a jerk who always called first and listened later:

Alas! for his lidship, McBolts,
The last of a long line of dolts.
His reflex, "I'll grab it!"
Became such a habit,
He shook hands with three thousand volts.

As Roger Andout headed for the podium that curious thundering gave way to the S9 whine of mysterious zero beatings. *Something* was tuning up. Roger evaded a shower of sizzling Retty-snitches and filed this bid for literary obscurity:

A scurrilous ham from Dundee
Fired up on the island of Squee.
The speed of his card
He was prone to retard
If you failed an appropriate fee.

Suddenly through trap doors in the roof of Long Hall, in the side entrances and on stage, there appeared avenging Whistlers of Gomera, masked and armed with dog X-ray machines that shot forth devastating beams of light and sound. Those Gomerans gleefully played fiery beams

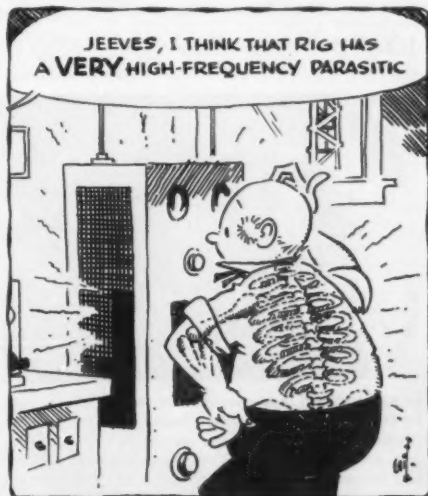
over the terrified audience, stampeding us toward blocked exits. Then we realized that their weapons actually were dog X-rays converted to function as *hog* X-rays! Panic reigned.

Here and there in the milling multitude skeletons appeared — disguised DX hogs revealed in their true horrible form by the hog X-ray technicians from Gomera. And as the skeletonized pigs among us howled and gyrated under the searing rays, one by one the miserable creatures reached blinding incandescence and exploded into nothingness like so much phantom popcorn. Dazed by the uproar and the carnage, Jeeves & Co. clawed frantically through a back exit already clogged by glowing, writhing, bursting skeletons. Escape! (But did we only *imagine* each other's grinning skull beginning to appear under those truth rays from Gomera?)

What:

May usually comes through in creditable DX fashion just before the summer squeeze sets in. But atmospherics are rising on our lower-frequency DX fronts, and east-west propagation unhappily dries up on 10 and 15 as the weeks go by. What's more, seasonal DX drop-offs from now on will be compounded by the steadily sagging sunspot count. Ah, still plenty of room for optimism, though, if you don't sink all your DX eggs in the 10- and 15-meter baskets. Let's see what the "How's" gang is doing on

40 phone. Not bad at all, judging from the reports of K2GXI, W3PHL (107 countries on the band), K8ONP and VERON: CE2MH (7299 kc.), CN8DG, CO2ZQ, CT1TX, DJ2XC, DL7AD, EA2ME 3JE, EL7A, FA8s BG RJ, FE8AH, FG7XE, Gs in quantity, GB2SM, GD3UB, GI3NSP, GM2BUD, H1SCJY, HK3EI 11 hours GMT, HP3FL, Hs AIM (95) 6, DFH ZCT, IT18MO, K3BUU/KP4, KG6NAA* (210), KH6PD/KM6* (204), KP4s A1U AKB APW YD, LA8 3G SJ, LX1DE, LZ1s



*4822 West Berteau Ave., Chicago 41, Ill.

FO UF, ON40C, OOSH, OYAS, PYs 7AD 7NS 7VBR 8SB, T180R0 (299) 7, UR2BU, VP: 2AL 2DJ 2DX 2KH 2LS 3HAG 3IG (100) 8, 3VN 4IQ 5EP 6RG 9ET, YV3AF, ZK1BS, ZLs 2BF 3BO (90) 5-6, 3ID* (135), ZP5KD, 9G1s BA CB and CC (* means s.s.b.). The Europeans hang out around 7100 kc., while VK/ZLs like it just below our Novice range. W3PHL gets his outstanding 7-Mc. voice results with 600 watts of a.m. and a homebrew 3-element rotary, transmitting mostly near 7296 kc. SWBC QRM? Just disregard it.

40 c.w. "is just as good as 20 here every morning," contends EL4A. "Been working stuff right up to 0800 GMT." In agreement are W1MBX, W2WAS (a fast 46 on 40), W2BEX, (60/47 worked/confirmed), countries, W2VHYR, K4s IEX IGD LRO, K5s JVF SUS, W6KGI, K6s CJF KDS 8XX, WA6HRS, W7LZF, K7s CFC ICW, W8s YGR YIN, W9s JIN ZYD, HRC, ISWL, JDXRC and VERON personnel, plus one "Marty" whose call eluded us: CMs 2WS 8EM 4, CNs 2AO 8BP, COs 2JK 2PY 5RV 8JP, CT2AL DM2ABL, DU7SV (11) 8, EA6 6AF 8BF (22) 5, 8CC 9EA, ELA 1K (28) 7-8, 3AD 4A (8) 6, F2CB/FC FASR, FK8AH (30), HA6 5KAG 5KBP 7PZ, HK1HL HPIAP, IT1s ACA GO TAL, three dozen JAI-2-3s, JA6 4AHX 4CF 4VL 5FQ 6AGW 6ALG 7KH/mm 7VJ 7XF 7ZP 9FV 00L 00P, many JA8s, KGs 4AG (25) 3, 6FAE (18) 8, KH6DL/KW6 (10) 8, KM6BR, KX6HQ (27) KZ5TD (25) 4, a flock of KP4s, LA8FG/p, LU2ZI (22) 6-7, LX1DE, LZs 1KBA 1KGZ 2KKZ, OA4s FM (5) 11-12, HY, OD5LX, OR4RW of Antarctica, OX3RH, OY2Z, PJ3AD, mucho LU/PYs, SM2BQE (11) 4, SP8MJ, ST2AM, TE3AB, TI2s CAH CMF LA 6-8, WR, UA9s CM (30) 19, KDN, UA0s AY AZ KAE (18) 12, KCO (13), KDA (6) 9, KID KZA (18) 6-7, UB8s IF WN ZG, UD6s AM FA KAF, UF6s AA (35) 19, KPA (37) 20, UH8s AJ (12) 1, BA (15) 21, UI8s AE KAE, UL7s HB (10) 1, IG LE, UM8KAB, UNIAH, UP2AL, UQ2AD, plenty of VK/ZLs, VO2NA, VP1s IJH 6, 2AR 8, 2KD (4) 3, 5FP of Turks, 7NT (33) 4, 9EP (15) 5, VR2DK (4) 9-10, VOZHN, VS90M (40) 23, XW8AL, YAIAO (17) 21, YN1AB, YS3CN (5) 4-5, IW/mm 5WE 6KBA, NU3WO, YV6 4AS 4-8, 4CI 5GO, ZAIKC, ZCAME, ZD2s GUP (4) 6-7, IHP, ZS4UP, 4X4s BL IE (15) 19, KC WF, 5ACV, 9G1s CB and CY. . . . WA6HRS, who gets his share on 7 Mc., demonstrates that you can't keep a good man down nor a good ham QRT: "XYL found a nice apartment here where no external antennas are allowed. Swimming pool, carpets, etc., but no wires. So I strung up a dipole in the attic. But that didn't work out, so I hung some invisible (NO. 28) wire between my second-floor window and a neighboring orchard. Success — DX!"

80 c.w. got rolling only to bash head-on into a wall of static. But W1MBX, WA2BEX, K3DZE, W6KC, W9s JIN ZYD, EL4A, VE2BCL, A. Rugg and ISWL deliver the word on AP4M (10) 23, DU7SV (11) 8, EI8J, JA3BP (2) 11, JT1YL (2-5) 12-13, OKs in quantity, PJ2AE (18) 8, SM2BQE, SP6FZ, UA1s IDZ 3GH 0KFI (4) 11, UB5WF, UO5AA, VP6s LJH (5) 7, 3YG (20) 8, 5ME (20) 8, YO8CA, YU1BK, YV5GO, ZLs 3JT (10) 8, 4NX (5) 7, 5ACV (5) 23 and 9M2FR (5) 4-5. . . . Juicy LX1DE and OH6NC* still abound on 75 phone, according to ISWL knob twirlers. . . . K54AZ and VP1JH were the last wonderful things to happen on 60 as we go to press. As W1BB puts it, wait'll next season — or long before!

10 phone. "with the declining sunspots, definitely has had it," comments W9JFT. "The openings have become less frequent and not nearly so solid. Too, with in-



HC8JU (HC9JU) was operated among the Galapagos by HC1JU aboard freighter *Cristobal Carrier* last December and January. There was no land-based work that qualified for DXCC credit, but Martell's KWM-1 and folded dipole sparked a batch of lively pile-ups nonetheless. (Photo via W1WPO)



ZE8JP is a strong argument for a 14-Mc. amateur VU channel. Until such a suballocation comes along you'll just have to be content to chat with Pat on old-fashioned phone and c.w. (Photo via W6JUI)

creasing numbers of new hams arriving on the band in hopes of cheap and easy DXCC, the QRM is rougher and the rare ones harder to find and work. Despite all this, 10 still holds enough to tease the diardards. The north-south path holds good, with all areas but CP and FY being heard." K1ADH (93/81), W2s DY JGF, K3EAN, WAUO, W6s KG UFI, K6CJF, WA6HRS, W9JFT, K0PJ, VE2BCL, A. Hovey and A. Rugg have the goods on CE3AGI, CN8s JD JF, CX5BR, EL8D (480) 18, FF8AP, FO8AE, GC3CGK, HI8GA, HKs 3LX 0AI (381) 22, HI9KR (360), HPIAC (300) 23, HZ1AB, JA3s EK (485) 23, JS, KA6 2DE 2FF 2NY 2YL 7DM, KGs IFF 4AP 6FAF, KJ6BV (890), KR6s DU GF, KM6BW, KV4s BT CF, KW6s CL DA/KM6 (287), KX6s AF (9002), BQ BT, LU6AC/mm, OA6 1W (410), 5H, OD5CL, ON4GM* (650), OX3AK, PJ3AD (481), PZ1AX, RB5KA, RN1AT, RP2ABA, SP5PRG, SV0WH, TGs 5HC (460), 9PS, TI6 2HP 2OE 9-11, 5JG (500) 22, UA1s DU KRW, UB5s KAE KAW VO, UQ2AN, UR2KAE, VK9RO, VP6s 2AR (410), 2DX 3HAG (370), 3MC 3YG 4TS 7NT, VR2HC, VU2BK, XE1POE, YN1s CPHW (410), YV1CS, ZC4MO, ZD2JKO, ZE7JV, ZLs 2BE 3JO, 5As 2CV and 5TA.

10 c.w. "has definitely not gone dead — yet," insists K9WQI. Paul, W1HDS, K2s UYG YXC, W2KMY, W40RT, K4s DFT OMR, W6s KG OIV YCF, K6s CJF SXX, WA6FWZ (24), W6KC, W7POU, W8YGR, W9JIN, K0s OSV OSW, I1ER and A. Rugg fill us in on CE6s IAD (30) 18, IAG (50) 19, 3AG (40) 19, CR6s AI (84) 16-19, CA, CX6s 2AZ (120), 2BT (23) 1, 4BC, DM6 2ANG (100), 3SF, EA6 8BF (60) 17, 9AP 16, EL8D, FF8BF, FG9XF (150) 18, HC1JU (48) 23, HKs 3TH 15, 0AI (140), IS1FIC, JAI-2-3s galore, JA6 4MH 5G8 8BP 8NB 9JG 0AC all around 23, KAZKS, KG6FAE (51) 21, KJ6BV, KL7DIE/VES, KR6IE, KV4s BO (30) 0, CG (20) 17, OX4FA (23), OE1RZ (100) 16, OQ6s IG 16, KJ 18, OX3RH, PJ2AL, RA6GF, RH5ABC, SPs 5QA 5AR, ST2AR (40) 17, TF3MB (50), TI5JG, UA6MG, UB5KAD, UQ2AB (100) 0, VK7JB, VP6s LJH (75) 18-19, 3YG (80) 18, 5FP 17, 5ME (48), 7NT (95) 19, VO6s 2MS 18, 2RG (90), 3CF 3HG, XE1s FE PJ, YV6s 3CD 5AEZ (35) 18, 5HL (10), ZC4SJ, ZD2s GUP (90), IHP JKO, ZE6s 2JS (72) 16, 3JJ (30), 5JT (100), 8JJ (59), 8JO 8JY (150) 20, ZLs 1HY 20, 1NQ (60), 2AUM, ZP6AY (100) 18, ZSs to spare, and 4X4E.

20 c.w. moves right along. "This decreasing-sunspots business certainly will call for more 7-Mc. work and more careful operation on 20," opines K2FG. "DX doesn't come as easy any more." But W1s LWV MBX (93/80), K1JTL, W2s CVW DY GVZ ICO, K2s QXG UYG, WA2s BEX EFN KMY (32), K3HMP, W4s IFO ORT (138/82), K4s HRG IEX IGD (125/11), LRO OMR

(174/149), K8SUS, W6s JQB KG OIV, K6s CJF (75/55), LAE (176/163), 8XX (35/17), W6HRS, W7POU (48/23), W6s YGR YIN, K8NHC, W6s JIN ZYD, K9KHU, W6DEI (188/177), K6s JPI (76/53), OSV OSW WQI, KH6DJP, IIER, VE2BCL and Andy Rugg do all right with Cn6 2AY 8BP 21, 8RM, COTRG (33) 21, CR4s AH 0, AX 23, CT1s CF IG, DM3s PO YVL, DU78s, EAs 8AP 1, 8BF 8CE 8CG (90) 17, 9AD 9AF, ELA4, ETECE (86) 14-15, FAs 2V 6, 9VJ, FB8s 8XX (41) 13, 8ZZ 3, 14, FF7s AB AG (5) 22, FG7XG, FK8AH (76), FORAC (25), F08s HK (50) 20, HO (20) 8, FY7YI (7), 12-13, GD3s FBS (18) 15, FXN (38) 16, UB (60) 23, HA1KSA, HCs JBU (37) 3, ILE (10), 2IU (42) 1, HH2LD, HKs 3TH (20), 0A1 (93) 12 of San Adria, HZ1s AB HZ (80) 20, IS1DKL (10) 21, IT1s AGA 22, AQ, JAa en masa, JZ0HA (55), KA5MC (80) 12, KC4UST (3), K6s 1BB 22, 1BX 4AL (25), 4AZ 0, 6AAZ 13, 6FAE (15) 22, KM6BQ (57), KR6s BB GF (8), SW (80), KV4s AA (79) 21, AQ CG (80), KX6BG, LA8FG/p 22, LZ1KIA, OA3D, OX3CN, OE2UR (100), OQ5s EH (26) 15, JY, OR4KR, OX3NK 23, PJs 2AL (10), 2AV (37) 4, 3AK 3AX (36), PX1PF, PZ1s AD AP (10) 21, ST2AR (37, 88) 5-23, SV0s BA/mm (10), WI 22, TF2s WEN (73), WEV, TI2DN, UA9AU, UA0s AZ 23, KCK KJA (50), KOA KJA (70) 22, UB5s and low, UG6s AD (46), CB (10), UF6s AE FB (32) 5, UG6s AB (10) 17, KAA (4), UH4AK (37) 15, UH8KAA (10) 15, UJ8RA, UL7H, HB (30) 5, KAA (44) 16, KBBs, UM8KA (40) 15-16, UO5s KRU (20) 7, PK (60) 5-6, UP2KBA (50) 18, VEs 6AAE/SU (25) 5, 0NM, VKs 9XK (85) 8, 0BS (55), 0PM, VP1s IJH (3-13), 3VN (100) 1, 3YG 4TF 23, 5ME 8BK (13) 3, 9CX 9EP 23, 9QQ 9WB 22, VQs 3CF 23, 4FX (65), 6GM (95) 22, YR2s 2DK (30) 8-13, 3Z (27) 7-8, VS6AE (35) 14, VU2s JG (83), RM (12) 16, XEs IAX IH 1XX 2GH, XZ2s BB (10), TH (16) 19, YN4AB (30) 4, YQ3WR, YV6s AZZ GO (75), ZBs IAO 21, 23, 2N 23, ZC4s IP 22, MO (55) 15, Z2Ds GUP (70) 6, JKs (32) 16, ZEs 2J8 (77) 16, 3JU (91) 0, 8J1 (27) 16, ZM6AA (25, 80) 8-16, ZP5LS, ZS7R, 4X4IA, 5A5TA and 9M2FR.

20 phone's new single-ended DX aspect is sampled by W2s DY JGF*, KZTDI, W4UO, K6LAE, W5YIN*, KH6DJP and listener A. Hovey who conjured up Cn6s 2BR (137), 8BB (170) 6, 8BE (199), CT2AH (176), DU6s 6IV 78V* (300), EA8BC (138), EL8F (174), ETECE (102), FP8AP (162), FS7RT* (323), GB2SM (181), ISG* (311) 14, K6s 4USV* 6GJ (245) 7, 6KR (245) 7, K6GAIL, KJ6BV, KG6IDA, KM6, KX6CA (216), LX1RK* (308) 13, OE7US (177), OQ5GA (200), OX3AL, TAZ3C* (300), UD6AK, UL7H, HB (30) 5, YK6s JM (56), PM, VP6s, 2AR (180), 3IAG (166), 3IG (155), 3YG (186), 5BF (146), 9L*, VQ4FK (152), VS6AE, W4HWR/KG6, YS1MS*, ZB2N, ZD2IKO (160), ZE7s JR (180) 15, JZ (180) 15, 4X4s AS (183), JS (194), 9G1CN (333) and 9M2GA (190) 14. "With conditions as spotty as they've been, I've turned to more random chatting. Good DX openings still stir the blood, though!" — K6LAE.

15 phone stirs the red DX corpses of KIIMD, W2DY, W4s IUO UWC* (110 on 21-Mc. a.s.b.), W6KG, K6LAE, K7CGK, W8BIE, K8NHC, K9MLE, K9JPJ, EL4A and Mr. Hovey, mainly because of CM2AB, Cn6s IIX* JT* Cn6s 8XZ, EL4s 3Z 2V* 43, 4C* 4D* 4Q*, one F8SAF (230), GD3UB, HINGA*, HKs 2RX 0AI (220) 3, HPIHC (235), HV1CN, HZ1AB*, K6s 1FD* 1FK* 1FR* 4AP*, KJ6BV, KM6BI (200) 5, LA6 5HF* 6VC*, LX1XH, OA4s ES* EU*, OE1s C8 78U*, OQ5IE*, PJs 2CE 3AH, PZ1AA, TF2WEM*, TG5HC (230) 23, TI2s CNP* HP8 10 18, UA1DZ*, VO2AI*, VP6s 2AB* 2DX 22, 2KW 2ML 3HAG (190) 2, 5AB 3AK 5HR 6WD* 7BI* 7NT* 9DC 9ET* 9ER*, VO4DT, VRs 2BC (220) 1, 6TC (115) 0, W6AFQ/KG6*, XE1s CV* 8N*, YN4CF (77), YS1MS*, YU3OV, YV6s 3AS SAGD (200) 0, 5ALT* 6BR*, ZDI8R, ZP6s CF (212) 0, 5LZ 6BR*, ZS7L, 4X4JU, 5As 2TZ* 3P*, 9G1BF* and 9M2GA (230) 0, all the asterisks, as aforementioned, indicating single-sideband specimens. W4UWC finds a slew of a.s.b. stuff between 21,400 and 21,450 kc.

15 c.w. still holds the record of W1s CTW (166 on 21 Mc.), MBX, K1s IVR JTL, W2s CVW GVZ, K2YXC, W2As BEF EFN CG KMY, K4s IEX IGV LRO OMR, K3s JZP (35/13), LLJ (39), W6s KG OIV UFJ, K6s CJP LAE 8XX, W7POU, K7s CJC CG, W8s KX YGR YIN, K8NHC, W8s JIN ZYD, K9s ACB KHU, K6s JPI OSV OSW WQI (103/3), EL4s IIER and A. Rugg by supplying CE4s IAD 3AG 3LV (40), Cn6s BP CA, CO7PG, CRs 5AR 6AI, CT1NT, CX2AZ, DM4ZNI, DU7SV (40) 1, EAs 8CG 9AP, EL1K, FF6s 7AG 8BF, FK8AH (60) 4, FQ8AF, GC3HFE, HIA5DH (50) 18, HCs IJU (47) 2, IJW 19, 2IU

(60) 0, HL9KJ (25) 2, HH2LD, HP1HC (235), JAa 1VX 3AF 3AV 3BB 3JM 3IS 3UI (70), 5FQ 7AD (75), 7KY 8GR 0AC (15), KA2CB (90), KC4USI 23, K6s 1BX 6AGL/mm 6FAE (55) 3, 6NAA, KM6BQ (90), KR6s AC (77) 3, QG, KX6BQ (30) 0, LA5AD/p, LZ2KBA, MP4TAF, OAs 3D (38) 2, 4BP, OE6s 1RZ 10, 3RE (42) 17, SSH 11, OQ5s JY (147) 20, KY RH, OX3RH (58) 20, SPs IJB IKA 2YK 0EZ, ST2AR, TP3MB (23), TI2CMF (45) 1, UA6s IAU 10, IKAG (35), 3BD 3DV 3KWA 0KCA 0KCO 0KFG 0KOA 0KZA, UR5WF (30), UC2s AC CB, UD6AM 9, UL7FA, UN1AB, UR2s BU KAE (90) 15, VP6s 1JH (68) 22, 2AT 2LS 3YG (38) 22-23, 5FP 22, 6AF (44) 1, 7NE 7NT 9EO, VQ6s 2GW 20, 2MS 2RG (52) 22, 2W 2WR 3CF 4CZ 4EV 4E 4FK 21, VS6s 1KB 4AB, VU2s BK MD RM 11-16, W6es 4JY DMU, WP4AQ, XEs 1PJ 1XX, XQ8AW (51) 20, YV5GO, ZBs 1A 1FA 21, ZD2s GUP JKO, ZEs 2J8 8JG 8JZ (35) 20, ZS7R, ZP9AY 22, 5As 2TO 2TZ and 5TA (W5LAK).

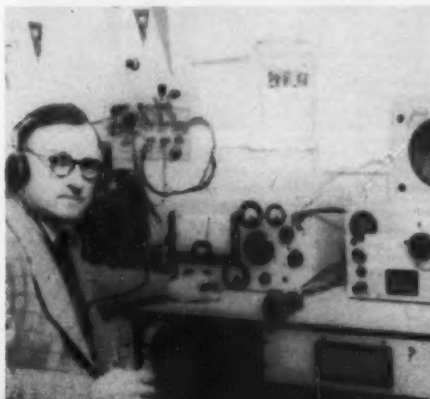
15 Novice DX dimers are making their moves ahead of the waning m.f. Here are KN1MOD, W2s GKK HVR (11/6), KN3HZL (now K3), KN4s FWJ MPE (42/17), W6HAK, KN6s PTM QRX (44/24), and KN9SRR with the scoop on Cn6s GV WF, CT1NT, DM2AGK, GW3s CBA MXN, HAs 1KSA 5KBC, HB9GJ, IIs CFY CLS, JAFED, K8SXN/KP4, KL7CDF, OA4BP, OHs 8OK 9PE, OK1s RX (20), ZW, ON4s JW QX, OQ5PS, PY3AWM, SL2AD just Sweden, UAs 4KED 9CL, UBSKAD, VEs8A, VO2JM, VP6s TNE 8EH, W6es DKE DMU DMV, WL7DHR, WP4s AUK AUL ARZ, ZEs 5JU 8JY, 5A2TZ and a log of DJ/DL F G PA8 SM and other European staples. "Just issued the new Novice DXCC to KN1HVT," flashes W1WPO of the ARRL DXCC Desk. "He's K1HVT now." Well! Chris follows in the footsteps of KN4RID (now K4RID) who became the first Novice-type Century Clubber a couple of years ago. Other WN/KN/WVs are on the DXCC verge but the ionosphere is thinning rapidly and 21-Mc. time is running out. . . .

Where:

Asia — BV1USE loses its operator to Wisconsin this month or next, says W2APQ, but the Taiwan outlet isn't expected to remain inactive for long. Meanwhile, file your BV1USE "Don" QSLs with W9HCR, self-addressed stamped envelopes their way. WCDXC learns that BV1USB operator ex-WOEN also ships homeward this month. . . . VU2RM tells W3KVQ your QSL for VU2ANI should bear no appended Andamans indicator, no "J" or "VU5." (Gosh, if contacts are sustained by log entries, it's hard to see how ambiguity could result in either case. Let's confirm QSOs, men, not cavil at trifles.) . . . W3KVQ offers to try his hand at securing your 487WP QSLs. "Drop me a card with full QSO data and I'll try to get confirmation." . . . Under new local policy the license of 9K2AZ (ex-MP4KAC) was withdrawn. Bill writes, "After ten years of operation from this QTH . . . if there are any of my contacts who have not yet received confirmations please have them send cards direct to my Callbook address and I will be very glad to confirm immediately." . . . VS8APs offered to QSL direct after trading QTHs. He must be new! So writes K2QXG who scored before the pale-ute act in . . . W4UO discloses, "VE3CDK was AC8WP in Shanghai before W4U." . . . MP4BCU mailed out a few hundred QSLs last December, all via the ISWL bureau," states s.w.l. A. Rugg of Quebec. "Also, BV1USB and DU1OR QSL promptly if supplied self-addressed envelopes and International Reply Coupons." . . . W1TS is told that XZ2TH is eager to hear QSL-wise from Greenlanders he has worked in the past. . . . QSLs for YAI8BV should go only via me," asserts DL8AX (ex-1854AX). . . . W1s OHA VG and other victims remind us to restate that YAI8BV closed down last August, recent indications to the contrary notwithstanding. . . . "Anyone desiring QSL from VU2SS for contact in the past three or four years should send another card via VU2PS," suggests W1RF. . . . Golly! K2As GI and ZZ, handling the FEARL(M) QSL bureau, report arrival of cards meant for WA2 and WA6 Stateside stations.

VP8BN of the Falklands appears on 10 through 80 meters with a neat 100-watt layout. This photo, however, tells only part of the story; Joe's XYL is VP8DR, and daughter Myriam regularly signs VP8DQ on 21-Mc. phone. (Photo via CX2AM and RCU)

May 1960



Evidently not a few amateurs figure that WA must be some sort of Yanks-in-Japan Novice prefix. KA2GI is really burning the operational oil: "Have sent out 700 QSLs for KA2GI work since October."

Africa — W3KVQ, the North American ZD1AW QSL dispensary, says, "All is doing a good job despite slow mail service from Sierra Leone. Two of his letters with log data got lost in the mails, and it has been a problem trying to get duplicate information. ZD1AW is very cooperative, so ask the boys to be patient on this one." — Rover Z83JY is having special cards printed for his widespread Africa operations, according to WGDXC, and will get them out from home base. — Fellow DXpeditionary enthusiast Z86IF/8 QSLs quickly on receipt of s.a.s.e. and necessary IRCs, notes observer A. Rugg. "I've just taken over the Stateside QSL duties of Z83X," advises W1DGJ. "S.a.s.e. are requested for direct replies; others will go via the bureau." — EL4A tabs Z87L an ardent stamp collector. Adorn your envelopes appropriately. — W4HYW has it that ex-5A2TY stands by at the address to follow with Libyan logs and QSLs to oblige those who still deserve his verifications. — In lines to WIWPO, CR7LU tells of her plans to handle CR7B8 QSL affairs. The latter is the WIAW of Mozambique, you know. — ZESJ still has ZESJ/JD6 cards on hand. "My policy is strictly QSL-on-receipt. QSLs via bureau, direct, or via W6UNF will be dealt with accordingly," goes his letter to WIWPO. — VQ3HG prides himself on a



Hock of 9M2FR likes 20 and 40, and we rather like his prefabricated do-it-yourself metalwork console. A change of QTH may keep 9M2FR inactive for a spell. (Photo via W3KVQ)

100-per-cent QSL policy but lost some confirmation records by fire. Reapily if your due pasteboard never arrived. — No such station as ZD38, according to authoritative circles consulted by WIJNV and others. — It occurs to W08II that someone may still seek his 5A5TW QSLs for 1958 action. "I still have a few of the handmade 5A5TW cards on hand. Same goes for the 40-meter phone lads who still require my DL4UW QSLs." — VERON and WGDXC supply a list of Ivory Coast Republic licensees, all FF4s: AA, G. Chapey, B.P. 781, Ave. Delafosse 34, Abidjan; AB, G. Laine, B.P. 1863, Abidjan; AC, J.-C. Vilard, B.P. 571, Abidjan; AD, J. Lepoitevin, B.P. 1745, Abidjan; AE, J. Marehand, B.P. 1175, Abidjan; AF, A. Grohimund, Korhogo; AG, G. Chanteloup, B.P. 4510, Abidjan; and AK, Y. Puiharaud, B.P. 100, Agboville. FF4s AA AE and AF are former FF5s CG BC and BK, respectively.

Oceania — K1JSH, who operated KJ6BV early last year, pens: "I recently worked KJ6BV for the first time since I left that QTH. Former KJ6BV operator Dirk, also active as W2EFS/KJ6, now can be reached at his U. S. address: R. C. Menley, USCG Lorain Stn. C-3, Jupiter, Fla. Myself, I tried to QSL 100 per cent at KJ6BV but still have a few cards left." — VK0PM, a new lad in his area, promises to answer all QSLs from VK4PM when he

returns home in March of next year." This from KH6DJP, ex-CN8EG-WIPWK. — K6GMA, QSL aide of V8s 4JT and 6AZ, wishes it stressed that his current address, a fairly new one, should be employed for all correspondence. Same follows. — Via WGDXC: ZL2ZX offers help to anyone needing QSLs for QSOs with ZL5s AA and AC. The Gullers also note VR3s QSLs emanating from Ray's VK3AOM affiliation. — VR3Z lately hied back to the U. K., assuring W0DEI he will take care of confirmational matters there via R5GB. — VK3JA, a 14- and 21-Mc. buff, informs W9JJN that someone arrogated his call for 40-meter monkeyshines last Christmastime. — Widely logged throughout the world on voice, VR2BC wants to spread the word that a.w.l. cards without IRCs cannot be acknowledged. Just too many.

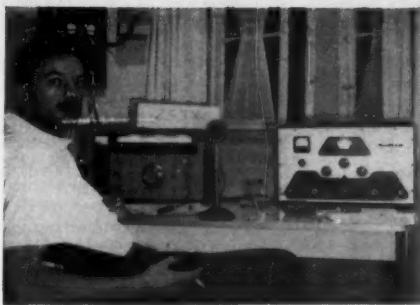
Europe — DL8AX reminds us he still gladly confirms QSOs made under his old Saarland label, 9S44X. — SCDXC lists the present DL4 QSL Bureau as DL4HAB, 50th Comm. Sqdn., APO 109, New York, N. Y. Ex-DL4WA still is trying to have QSLs forwarded to his K3KMO address (which follows) but you may have to contact Al direct. K3KMO, of course, cannot be responsible for QSOs made by other DL4WA licensees now or prior to his tenure. — Ex-SV8WP (W3JTC) and YU1KQ tell W8KX that SV1KX and YI2AQ have no basis in fact. — Regarding possible correspondence with the Netherlands society, note in the roster to follow that VERON traffic manager and DX editor P80LOU has a new QTH. — From K2RYP of the SV8WT/Crete gang: "I am taking care of my own SV8WT cards, asking that those for me be forwarded via my father, WY3JQC. We have one main station log, but I also keep a log of my own operation so I can properly fill out my own QSLs. Several operators here are named 'Jim', so my call should be specified. By the way, my personal call, SV8WY, was previously issued to a man in Athens. I am receiving cards for him but I do not have his logs and do not know where he is now located." — Note in the *Callbook* that there are two possible bureaus for the relay of all SV-bound QSLs.

South America — VP4WD writes Ws ITS and 4CXQ from his G3TA home QTH: "I have sent QSL cards to all stations who sent cards to me, and will definitely QSL 100 per cent all contacts which are recorded in the log, provided I receive cards from these stations first. I have a stock of approximately 300 QSLs remaining." W4CXQ understands that VP4WD, while on Tobago, answered each card by air mail within 24 hours of receipt. — The contemporary PY5FO, listed okay in the *Callbook*, desires it emphasized that another feller signed that call before October, 1958. The former PY5FO now is PY1ACF. — CX2AM lists Falklands licensees VP8s AB AC AH AI AQ AS BG BJ CV CW CX CD DE DF DJ DO DP DS DU DV DW DZ EA EC ED EM and EQ who can be QSLd via the Uruguay society, RCU. VP8s in other localities cannot be reached via this route. W3IPO observes that G2RF does QSL honors for VP8EZ, G3IAF for VP8CC, VP8BK (LA IRC) of South Georgia indicates through W8KG that his confirmatory debts will be liquidated upon return to Norway later in the year.

Hereabouts — As of mid-March, W2CTN's vast QSL-agency philanthropies extended to CN2BK, CR4s AH AV AX, FGTXF, FK8s AI AT AW, FM7WP, HR2FG, JZ8s DA HA, KW6s CP CU, OQ3s BC IG, OX3s DL RH, TQ9AL, T12WD, VKs 2FR 9CK 9NT, VK8E, VK8T, VQs 2EW 3CF 3IH 4AQ, VR2s DA DK, ZB2I, ZD2DCP, ZS7M, 9G1BQ and the non-W/K contacts of FM7WU. Y810 assures Jack there are no Y84s, incidentally. VP2KH has removed to the Virgin Islands but W2CTN has Cromwell's St. Kitts log on file for the period March, 1959, to February 23, 1960. Don't omit the s.a.s.e. when applying for W2CTN's favors. — W3KVQ holds the VP2AR ledger dating from January 14th of this year. "Mickey is very prompt with log data, so I have been able to give rapid service on QSLs." — "No IRCs are needed by VP7NT," remarks W7LZF, "because his mail comes out of Florida." Same goes for other VPs in similar circumstances. — "I am QSL manager for VP2LS," states W8QHW in lines to WIWPO. "The usual s.a.s.e. will bring reply — when I receive his logs and cards." — "I've been appointed QSL manager for VP5AB of the Turks & Caicos for QSOs starting March 1, 1960," notifies W3AYD. "Jim will send log copies about once a month. The customary s.a.s.e. for direct response applies; otherwise cards will be sent via bureau." — In beneficent efforts previously acknowledged in "How's," K6BX was responsible for the shipment of 103 recent-vintage *Callbooks* to deserving overseas DXers in February. — Now let's see what we have in file for the month's crop of specific notations. We wish you the best of luck with . . .

BYUISE (via W9HCR; see preceding text)
CR6CA (via K4SXO)

ex-DL4WA, A. Brorndon, K3KMO, 316 W. Fairmount Av., State College, Penna.
EA8CP, A. P. Perez, Box 215, Santa Cruz de Tenerife, Canary Islands



ZS3X returns to his dials after some years QRT and finds himself quite popular with a DX-100B, NC-303 and TA-33 twirler. John intends to add single-sideband facilities. (Photo via W1DGG)

F7GC, Lt. Col. J. V. Fill, Sig. Div. USAELE, Hq. SHAPE, APO 55, New York, N. Y.
FB8GP, M. Pigeau, Chef de Centre des PTT, Dzaoudzi, Comoro Islands
FF4s AA through **AH** (see text preceding)
FF7AB, Nouakchott, Mauritania Republic
ex-FF8s BC BK CG (see text preceding)
FF8CP, P.O. 5098, Dakar, F.W.A.
HKs, W9EVI & Co. (Malpelo) (via K9DVF, Swani Radio Club)
HPIHG, P.O. Box 3823, Panama, R.P.
JA3EK, H. Kato, Box 527, Osaka, Japan
K2IVB/KAB, 1964th AACSRON, APO 815, San Francisco, Calif.
K4ASK/KP4, O. Dismuke, c/o Naval Radio Stn., Sabana Seca, Puerto Rico
K6COV/KS6, P. Hodges, Airport Project, Pago Pago, Samoa
K7IKN/VO2, J. Carragher, 212 Park Dr., Sterling, Ill.
K8SCP/VO1, Box 73, Navy 103, FPO, New York, N. Y.
K8OXA/VO2 (to K8OXA)
KH6DJL/KW6, L. Hoops, Box 68, Wake Island
KJ6BV, CG Loran Stn., Johnston, APO 105, San Francisco, Calif. (see preceding text)
ex-KM6BK, K7KLS, 10 Erwin St., Las Vegas, Nev.
KW6A/KM6 (via KM6BI)
LUDIRA (via KP4APL)
LUTZL, D. Luizon, Calle Dolores 186, Buenos Aires, Argentina
MP4BCZ, A. Everest, Stn. P.O. RAF, Bahrain, BFPO 63
ex-OE1KK, H. Putsch, WA2KMY, RD 3, Baldwinville, N. Y.
OQ5KY, Gandajika, Belgian Congo
OR4KR (via URA or to ON4KR)
PAMLOU, L. v.d. Nadort, Bospolderstraat 15, Nieuwerkerk a.d. IJssel, Netherlands
PJ3AJ, P.O. Box 907, Seroc Colorado, Aruba, N.A.
SV8WT Crete (see text preceding)
TA2AR, Box 141, Ankara, Turkey
TA3GI (via VE7ZM)
TF2WEV, 667th AC&W Sqdn., APO 81, New York, N. Y.
UA3FG, P.O. Box 570, Moscow, U.S.S.R.
UA8QB, DOSAAF Radio Club, Ul. Yaroslavskogo 11, Yakutsk, U.S.S.R.
UB5WF, V. N. Gonchursky, Box 41, Lvov, Ukrainian S.S.R.
UQ2AB, P. Brastins, P.O. Box 126, Riga, Latvian S.S.R.
VK8AB (via VK3APV)
VK8PM (to VK4PM)
ex-VP2KH (via W2CTN)
VP2LS (via W3QHW)
VP2ML (via K4SKO)
VP4TF, C. Gomes, 8 Rosalino St., Woodbrook, Port of Spain, Trinidad
VP5AB (via W3AYD; see text preceding)
VP7BZ, H. Champion, P.O. Box 281, Nassau, Bahamas
VP7NT, A. Lawrie (W2DKS), PAA/GE, San Salvador AAFB, via Patrick AFB, Fla.
VP8BE (via RSGB)
VP8CC (via G3JAF)
VP8EH, Base A, Port Lockroy, via Port Stanley, Falkland Islands
VP8EZ (via G2RF)
VR2BQ, K. Mowart, c/o Aeradio, Nadi Airport, Fiji Islands
VR2DT, A. Waters, c/o Aeradio, Nadi Airport, Fiji Islands
ex-VR3A (to VK3AOM)
VR3Z (via RSGB)
VS1KG, 14 Jalan Sappan Way, Singapore 20
VS1KM (via W9ZRG)

VS4JIT 6AZ, via W. Knight, K6GMA, 13841 McMains St., Garden Grove, Calif.
VS8GS, SOAS College, Brunei Town, Brunei
ex-VS5JL, J. Lovelock, 33 Graham Av., Te Atatu, Auckland, New Zealand
VS9APS, Block 220/1, RAF, Steamer Point, Aden, BFPO 69
VS9ARF (via VS9AZ)
VU2AG (via G8VG)
VU2SS (to VU2PS)
ex-W2EPS/KJ6 (see text preceding)
W6VHN/KH6, J. Houlahan, Box 8036, Honolulu, Hawaii
W7AIH/KG6, B. Neuman, Box 277, APO 334, San Francisco, Calif.
XE2DO, P.O. Box 297, Obregon, Sonora, Mexico
YA1BW (via DL8AX)
YV3CD, S. Adames, Box 199, Barquisimeto, Venezuela
YV4AS, Victor Pic, Puerto Cabello Airport, Venezuela
ZB1ALP, A. Podesta, 37 Victoria Av., Sliema, Malta
ZDIAC (via RSGB)
ex-ZD1GM (via ZD1DCP)
ZD1RO, Box 51, Freetown, Sierra Leone
ZM6AA, Faleolo Airport, Western Samoa
ZP6BB, c/o USAF Mission, U. S. Embassy, Asuncion, Paraguay
ZS3X (W/Ks via W1DGG)
ZS7R, Box 98, Mbabane, Swaziland
3A2CZ (to ON4QX)
4S7WP (see text preceding)
5A2CV, RAF Stn. El Adem, Libya, BFPO 56
ex-5A2TY, SFC S. Harrison, c/o MARS W4USA, Ft. McPherson, Ga.
ex-5A5TW-DL4UW, H. Lufkin, W8SH, 1400 Kingston, Aurora, Colo.
9M2GT (via MARTS)

The forerunning Who's Where comes through the generous auspices of W1s JNV RF UED WPO, K1s ADH JTL LJV, W2s AFQ DY GVZ ICD WAS, K2s QXG UYG, WA2KMY, W3s IPO KVQ, K3CYA, W4s CXQ HYW UO KRR LWC, K4s IEX IGD OMR, K5VW W6KG, W7s LZT UWT, W8s KX YGR YTN, W9s JLN QQG, W9DET, K9WQI, DL8AX, EL4s KH6IDJ, VE5YL, A. Rugg, A. Hovey, Fiji Radio Club, Hamsters Radio Club, International Radio Listeners League, International Short Wave League, Japan DX Radio Club, Malaya Amateur Radio Transmitters Society, Newark News Radio Club, Northern California DX Club, Ohio Valley Amateur Radio Association, Southern California DX Club, Universal Radio DX Club, VERON (Holland) DXpress, West Gulf DX Club and Willamette Valley DX Club.

Whence:

Africa — DX developments are at fever pitch on the once Dark Continent. Still obscured by clouds of journalistic confusion are the Republic of Mauritania (FF7), Ivory Coast Republic (FF4), Republic of Mali (apparently French Sudan plus Senegal), autonomies of Chad, Central Africa, Congo and Gabon, plus other possibilities involving the regions of High Volta, French Nigeria and Dahomey. FF7s



VP4WD (G3TA) put scarce Tobago on 20 and 40 from September through January. Jack's makeshift installation limited results but he managed some 500 contacts with 46 countries, including 350 W/K QSOs. G3TA's Tobago sojourn concerned the filming of Swiss Family Robinson, a flicker DX men will look forward to. (Photo via Ws ITS and 4CXQ)

CAUTION

Under this country's treaty obligations and on formal notice received from other nations, FCC-licensed amateurs are warned to engage in no communications with stations in the countries listed below. This is in accordance with FCC Public Notice of December 21, 1950 (p. 23, Feb., 1951 QST), and as since revised.

Cambodia (XU), Indonesia (PK, YB-YH), Iran (EP-EQ), and Vietnam (XV, 3W).

For those whose QST files do not go back to 1950 we will gladly supply, upon request, literature describing the circumstances of this prohibition.

ABAG and FF4AB spearhead on-the-air activity from this scene of historic geopolitical flux, and 7G1A already has established Republic of Guinea as a solid DX entity. All this commotion concerns the swift and somewhat painful progress of former French colonial territories toward self-governing status. Keep your eye on the DXCC Notes segment of QST's Operating News section for any ensuing revisions of the ARRL DXCC Countries List Liberia lore courtesy EL4A (W7VCB) "Took a week's vacation for eyeball QSOs with ELs 1P 2F 2Z 6F 8D 8F and a few others. Main topic of conversation here seems to be the climatic ruination of radio gear, unpredictable electric power and unpredictable mail service. Miscellaneous notes — EL4L uses my rig daily at 1830 GMT on 10 and 15 phone and has a 64/15 record since December. . . . Our new ship captain of the *MY Lizzie Lorimer* will take the call EL4G and he hopes to have his mobile marine 60-watter on 10 and 15 phone soon. . . . EL3A is home on leave but EL3D keeps his rig hot. . . . EL2V (ex-EL5A) has a rhombic perking and is really knockin' em off. . . . EL2Z works a.s.b. with a Vee and triband rotary. . . . EL4A toys with the idea of building up an aeronautical mobile hamming outfit in the company plane. Wonder what the best aero-to-aero DX record is. Right now I run 50 watts to an 807 on 5521.5 and 8820 kc. as ELAAV. . . . One of Liberia's senior amateurs, EL2D, was killed in an auto accident in Ghana recently. Dr. West was not very active on the air but he helped shape amateur radio policies in Liberia. . . . Ex-5A5TW (1958) will head for Europe next year to resume DX operations on 15, 20 and 40 phone. He's W881L. . . . From VQ4KRL to W2CTN: "VQ4AQ will be leaving for a trip around the Seychelles group in early August. Watch out for him from some rare spots such as VQ7-8-9. His tour will take a month." VQ9HB arrived in Chagos around mid-March with his c.w. 20-watter OQ5RL, borrowing equipment here and there, worked plenty of DX as a Congo portable-mobile from last November to mid-February. Bob, who signs W8FTD on our side, really circulated, operating from the locations of OQs 5IX 5ITZ 5IE 5IK 5IL 5JA 5KW 5MA 5PS 6DM and 6WZ under his own OQ5RL tag on 10, 15 and 20, phone and c.w. From W7UWT: "OQ5KY desires it known that he will be on the air every day except Saturdays, 28,200 or 28,495 kc., 2100-2300 GMT or later." FB8ZZ's traditional non-T9 signal is reported workable by W2ICO on the long path at 1400 GMT, the short route at 0300 "Within three months I'll move to France and sign an F8 call." OQ8RH tells K1JTL Africa additives thanks to ISWL, NNHC, VERON and WGDXC fraternities: Conditions were rough for ZD2AMS at FDSAMS. Next time Angus will tote more power and a beam. . . . GW8ITD/MS aboard HMS *Puma* may try land-based ZD9

FQ8AE pounds in from Brazzaville on 10 phone of many a U.S.A. afternoon. When the band is closed for Camille's DX-40 and long-wire he spruces up his extensive stamp collection. (Photo via W9JFT)



work this month, VQ8 business later. . . . MP6DAA shifts his petroleum and midnight oil operations from Das Isle to Libya. . . . ZD2CKH goes on leave this month, to England in a light plane that requires a refill every 300 miles.

Asia — WA6DMD/mi's *Bella Kase* (see p. 78, January QST) made it to Singapore on its leisurely world tour but lost two transistors in the rig's Heathkit power pack. Carl & Co. hope to have 21-Mc. communications again by the time you read this VU2ANI's Andaman tally weighs in at 3350 contacts with 126 countries, reports W3KVKQ "I will be operating from Iwo Jima for about fifteen months," informs K2IVB. The orobable call: K2IVB/K40 KA2GI still pursues So. Dak. and W. Va. for WAS, principally on phone around 28,450 kc., occasionally on 21 Mc. FEARLOM reminds us of the WFKAS (Worked Five KA Stations) and WTKFAS (Worked Twenty-Five KA Stations) certifications available to DXers world wide. The titles are self-descriptive but check with the society, APO 994, San Francisco, Calif., for full details "BV1UE will close operation May 15th," reveals W2AFQ. "A new operator will be available in about four months, c.w. only." Asian oddments via JDXRC, VERON, WGDXC and WVDXC: Turkey's ham atmosphere still is defogged. TA3GH, 14,303-kc. sideband at 1800-2100 GMT, shuns much publicity. TA3AI reported QTH appears in last month's "Where, rubric. TA2AR's this month. . . . Japan DX Radio Club officers for the current term: JAs 8AA, pres.; 1AG and 1TD, editors; 1BF, awards mgr.; 1AA and 8AA, directors. . . . Nepal now seems well represented with 9N is CJ and GW on sideband, FV on c.w. and a.m., mainly 14 Mc. . . . VU2KV hopes to produce more c.w. action in Sikkim. . . . JA1ADN is JA1ACB's collaborator toward Marcus Island QSOs. . . . UABQ is said to be rolling Wrangell Island QSOs down the 20-meter c.w. slot. . . . Headquarters, U. S. Forces, Japan, wants us to point out that U. S. Forces in Japan operate auxiliary military radio stations in the amateur service, using call signs KA2 through KA9. Novice operation or portable operation is not permitted, and under no circumstances are FCC assigned call signs followed by a 'KA' permitted. Any station signing his call as such is not a legal station.

Oceania — "KJ6BV will be on every week end near 29 Mc.," apprises K1JSH who operated the Johnston outlet himself last year. KH6DJP finds KJ6BV also available on 14,240 kc. after 0700 GMT. "I'm getting lined up for a quick trip to Rotuma Island," writes VR2BC. "I'll try to get on 10 and/or 15 for a few QSOs depending on time available, but Her Majesty's business comes first!" Greg seeks ways and means to shake QSLs loose from ET3LF and F8AF. "ZL3VH/3 went QRT on the Chatham Islands February 1st," documents KH6DJP, admiring Pye's exceptional results with a mere crystal-controlled 12-watter (400 contacts with 25 countries). ZL3VH hoped to bring 100 watts and a v.f.o. with him to the Tokelau soon thereafter. KL7AZZ designates 14,080 kc. as ZL3VH's favorite DX-peditionary hangout More from KH6DJP: "VR3W popped into town and gave me a call on the landline. VR5PM knocks about on 21,035 kc. around 0400-0530 GMT. Also watch for KC6s KR and GJ, West and East Carolines near 14,245 kc., 0700. See the other day a Novice told me, 'Thanks for FB contact, Steve. Need your QSL for a new state, new country and new continent.'" KH6s really are on the spot these days W8YIN lists South Australia sidebanders VK5s AB DC and EF. VR3Z is ex-DL2MZ-G3DAF, finds W6KG K6BX learns that the venerable B-610 at DU78V is slowly disintegrating, jeopardizing the workability of the most active DXer in the Philippines. K6CJF adds, "How would any of us ever have confirmed DU if it weren't for Volt? His QSL has appeared in every 'DXCC' collection you have shown, and DU78V shows up almost every month in your 15-meter Novice DX collections. What a guy!" VK9AD feels that Willis Island will have some new VK4 feeds shortly, according to WGDXC. Fresh radiopoint tours commence there this month Fiji Radio Club's *Splatter* says that VR2DO gets over to Pitcairn on occasion We'll save you a reach for your atlas and touch upon the Auckland & Campbell Islands whose addition (as one country) to your ARRL DXCC Countries List was announced last month. The Auckland group, 234 square miles of normally uninhabited volcanic scenery with several good harbors, was first mapped in 1806 and served as a whaling station till 1852. A cache of food and clothing for shipwrecked mariners is maintained there. To the southeast lies Campbell, of comparable status and geology, whose 44 square miles were discovered in 1810. Well-known Macquarie isn't far away. We trust that ZL4JF and colleagues henceforth will operate from lead-lined corona-proof hushacks.

Europe — "ON4QX will operate 3A2CZ from May 2nd to 18th, 14,010 kc.," ZS6IF tells W4KRR. VERON's PACC DX contest terminates the last of this month, and don't forget the U.S.S.R. world-wide competition on the 7th-8th (details last month, p. 66) SV0WT/Crete chatter from K2RYP on the scene: "We

(Continued on page 160)

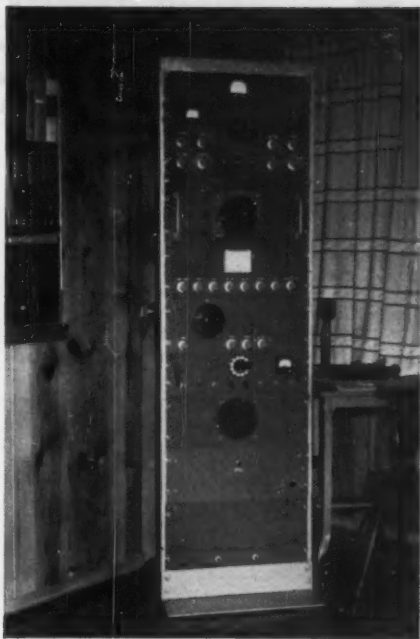
QST for

Home-Built Stations

Photos of home-built stations continue to come in, an indication that the pioneering spirit in ham radio is not entirely dead. One of the past year's most interesting trends has been the number of receiver articles submitted to QST. Keep the photos coming, gang. We'll print them as space permits.

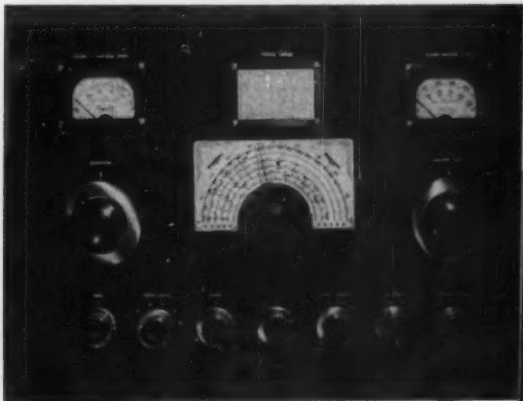


Above at the left is the station of K3GJQ. The transmitter is the 90-watt job originally described by W1IKE in QST for May, 1955, while the receiver is the now-famous HBR-14. Both the modulator and the v.f.o. also come from QST and the Handbook. Included in the station equipment is a cone/rad monitor and the Little Oskey keying monitor.



Above at the right is the complete station (sans antennas) of W6STA, whom many of you will recognize as a QST author. His tuner and converters were described in the July, 1958, issue of QST. His i.f. strip is patterned after W1DX's description in January, 1957, QST. The sideband transmitter was described by W6TEU in June, 1958, QST.

The two photos below are close-ups of the gear built by K6AOV, who is another one of the ardent champions of home-built stations. At the left is another HBR-14. Incidentally, K6AOV volunteers to help anyone who runs into problems with the HBR receivers, inasmuch as he's had quite a bit of experience with them. At the right is his version of the popular 813 rig that was originally described by W1JEQ back in January, 1954. This particular design has been duplicated by more QST readers than perhaps any other unit. K6AOV did a real neat job, didn't he!





Y L NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

GETTING INTO THE LIMELIGHT

Did you read the editorial in February *QST* entitled "Bread and Butter Publicity"? We're sure you did, of course, but some of the points made are worth repeating here. As we've often said, it seems to us that there is a particular affinity between YLs and good publicity for ham radio.

The February editorial stressed that the effectiveness of local publicity is that it concerns people known and respected in the community. "A continuing series of local news items, however minor they may seem and however little the impact of any single one, before long can get across the point that neighbor amateurs are a community asset, active in the 'public interest, convenience, and necessity'."

Here are some of the newspaper items that have brought attention to YLs in community newspapers recently. Transmitter Best Anniversary Gift (K4LVE) — Grandma Chose to be a Ham (K2IYP) — City Woman, Daughter Sked Daily Chat (K2TDG) — Ham Operates from her Kitchen (KN3IGL) — Life Begins at Eighty for Woman Ham" (K4UIN) — Hams Help Flow of Mail to Local Homes (K5DAI) — Local Woman Widely Known as Ham Radio Fan (W4SGD) — Ham Operator Tells Civil Defense Role (K6KCI). These are but a very few of the type of newspaper clippings regularly received. Factual, interesting items which surely make good promotional material for our hobby.

Just consider the photos shown here this month alone. Can you see any possibilities for news-

*YL editor, *QST*: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.



Officers for 1960 of the GAYLARK (Gulf Area YL Amateur Radio Klub) are, left to right: Pres. Alverta Look, K5MIZ; Club Historian Phyllis Riblet, W5CXM; Vice Pres. Yvonne Mathias, W5DRA; Secy.-Treas. Grace Tracy, K5YTT (ex K1JMET). An energetic new club (two years old), GAYLARK hosted YL activities for the ARRL national convention in Galveston last June.

paper items? Pretty teen-age girls go home from school and chat with fellow hams the world over. Lady oboe player in the Houston Symphony Orchestra recently elected an officer of a club of women radio hams in Texas (K5YTT). Five local women sparkplug plans for convention of women amateur operators from all over the world in June. Colorado professor's wife receives special national citation from the Edison Company for relaying thousands of messages annually for the general public. Group of California women keep communications running smoothly during Olympic Winter Games at Squaw Valley. Pioneer Radio Ham Carries on at 84 — this headline has already been used for a story on W1ZR that appeared in the *Boston Sunday Herald*, January 4 this year. Newsworthy stories could easily be drawn from each of these photographs.

Avail yourself of the aids the League has specifically designed to help you generate local publicity. A copy of "Getting Newspaper Publicity for Your Club and Amateur Radio" is yours for the asking. Check the February editorial again for other League aids covering radio and television interviews that are available and refer back to this column for March 1958 with specific suggestions for promoting radio and TV shows. YL clubs especially are urged to consider engaging as a group in this latter type of project.

Whatever you may choose to do, and we hope you are inspired to immediate action, good publicity to you for amateur radio!

OPERATION SQUAW VALLEY

Several members of the amateur communications team at the Eighth Olympic Winter Games at Squaw Valley, California, were YLs. The following report, based on information received from Esther Given, W6BDE, and Gladys Eastman, W6DXI, and Mrs. Wally Buckley, centers mainly on YL participation in the operation.

The Olympics communications group included, ex-W6DGE, Marion V. Long, Director of Communications; OM hams Max Kapelowitz, K6HSE, Sixth Army Technical Advisor; L. R. LaDue, W6JEQ; Vic Tucker, K6SEA; Fred Loebacher, W6OPL; Wally Buckley, W6GGC; Ken Oldford, K6RHD; Carey Magnum, W6WWW; John Holme, W6MSI; Mac Rousseau, W6UN; Bruce Baker, W6YRK; and YLs Esther Given, W6BDE; Gladys Eastman, W6DXI (President of the YLRL); Pat Gaff, K6HOL; Joyce Harrington, K6QCL; and Frances Tucker, K6SBL.

These operators handled nets of ski patrolmen, snow vehicles, personnel taxi service and communications relay stations, and in addition, they operated amateur station K6USA in their off shift hours.

K6USA was unable to operate during daytime hours since KCBS TV headquarters was right outside the window of the communications center, and the rigs were not sufficiently TVI proofed. This factor confined operation at K6USA to the hours of 5:00 P.M. to 6:00 A.M. but transportation for operating personnel during these hours was not of the best



On the steps of the communications shack at Squaw Valley, above, in front are l. to r. K6SBL, K6HOI, W6DXI, rear, K6QCL and W6BDE. (photo via W6DXI)

W6DXI and W6BDE, left, set up a power generator at McKinney Creek. (photo via W6DXI)



Hard at work for months on elaborate plans for the YLRL convention in June at Cambridge, Mass., have been committee members (l. to r.) Helen Harris, W1HOY; Edith McCracken, K1EKO; Blanche Randles, K1IZT; Chata Swenson, W1RLQ; and Onie Woodward, W1ZEN (seated). Millie Doremus, W1SVN, co-chairman with W1ZEN, was not on hand when photo was taken.

(Photo by K1HTK)



Work all members of the Ryden family of Birmingham, Michigan, and you'll receive their personal certificate. Favorite band with the four Rydens is 21 Mc. c.w. In the photo, left to right: Sally, K8ONW, Mary, K8ONV, Alicia, KN8RBB, and Ken, KN8OHG. (photo via DU7SV and W9BRD)



Emilie Schier, K3GJE, and her dad, K3GJH, operate s.s.b. on 20 and 15 meters from the Veterans Hospital at Ft. Howard, Maryland. A DXCC certificate is 15 year-old Emilie's immediate ham goal.

"Really rare and active" is W9BRD's own pronouncement on this ham family, of the Folklands. The two youngest YLs have yet to get their tickets, but Mom is VP8BR, Dad CX2AM, and oldest daughter VP8BQ. VP8BR and CX2AM operate 10 thru 80 meters. Myriam, very popular on 15, is gunning for DXCC. (Photo via CX2AM and W9BRD)





Winner of 1959 Edison Award citation, Irene H. Craft, WØKQD, of Alamosa, Colorado.
(Photo by Virginia Shaffer)

so frequently working time at K6USA was lost, since most of the operators were billeted many miles from Squaw Valley. In spite of this problem, K6USA operators logged 1098 contacts, working 10, 15, 20, and 75 (the rig wouldn't load properly on 40).

Pat, K6HOL, Fran, K6SBL, and Joyce, K6QCL were assigned to the communications center at Squaw Valley. They alternated shifts with the OMs for 24 hour coverage. Gladys, W6DXI, and Esther, W6BDE, were at McKinney Creek, 18 miles south of Squaw Valley, in the area where the Cross Country races were held.

The operation consisted of operating NCS in two nets, Transportation and Rescue. Net stations were radio-equipped weasles in the Transportation net and pack units for ski patrol in the Rescue net. The NCS was thus able to follow the progress of the various units which checked in at least every 15 minutes. These units were located along the race course in order that any mishaps could be immediately reported, rescue operations started and the hospital alerted.

W6DXI and W6BDE did all of the race time radio operation at McKinney, acting as NCS of the above nets.

Quoting W6BDE verbatim: "We were extremely lucky at McKinney as we had a huge window in front of the operating position right on the start-finish line. We were closer than the press. We didn't get to meet many of the contestants personally but waved at most of them and generally got a big wave or smile in return. Some of the gals were really cute, but we only saw them in the "huff and puff" state. Cross country skiing is only for the most rugged. Some skiers were so exhausted on finishing they actually slumped and had to be given oxygen. All in all, the Olympics were elegant. The weather was so perfect and snow conditions so ideal for each of the races that the Russians must have gone home convinced that the Americans have solved weather control. The communications activity was well organized and ran very smoothly, and we can't give enough credit to Marion Long, Communications Director, for a terrific job done."



W1ZR, Edith E. Rotch, in her QTH.

WØKQD

In conjunction with the 1959 Edison Radio Amateur Award a special citation was issued to Irene H. Craft, WØKQD, for her emergency and traffic organization achievements.

The amateur record that stands behind this citation is extensive. A resume of this record follows. It is not always possible to delve into a ham career in such detail, but occasionally it may be interesting to elaborate on how intensive one YL's amateur activities can be.

Irene H. Craft, WØKQD, Alamosa, Colorado

General license: June 1935.

Equipment: B & W 5100 transmitter, NC-300 receiver, Matchbox, 137 ft. dipole with 67 ft. open wire feeders; Morrow CM-1 Conelrad monitor, Vibroplex Original bug, Astatic microphone, Johnson Signal Sentry and Micromatch.

Code speed: 25 w.p.m. Code Proficiency Certificate — can copy 30-35 w.p.m.

Operating time: Divided about equally between phone and c.w.

Appointments: ORS, RM, Colorado four years; EC, San Luis Valley six years and currently; CD RO, San Luis Valley five years; Trustee Sky Hi RC station, WØRTA; Transcontinental Corps Director for Pacific Area of NTS two years; OBS.

Activities: Member Colorado Emergency Phone Net for two years; Chartermember Colorado Hi Noon Net, manager and asst. manager, active five years and currently; Manager Colorado Slow Speed Net one year; active in Transcontinental Corps five years and currently; active in Pacific Area six years and currently; active in Twelfth Regional Net since its beginning (and currently) and in Rocky Mountain Net which preceded it; active in Colorado C.W. Net since its beginning and currently; member Pacific Area Staff; Secretary Sky Hi Radio Club two years.

She has accumulated about 36,000 traffic points through handling third party messages — has spoken via amateur radio to public school classes, girl scouts, etc. — has given programs for women's clubs with radio demonstrations — has given code tests to 35 people taking exams for amateur licenses; — has taught code at Adams State College.

Awards: Public Service Award for work during flood of Purgatoire River in Colorado; A-1 Operator; Brass Pounders League Medallion (first in Colorado); 34 BPL certificates earned at home station and 8 at WØRTA, Sky Hi RC station; Award of Merit for Public Service (issued by Colorado SCM); RCC; numerous net certificates; Edison citation.

WØKQD has a twelve-year-old daughter. Her OM, Chairman of the Division of Science and Mathematics at Adams State College is NOT a ham. Irene says it was his idea originally that she should get a ham license, but that he didn't quite know what he was starting!

84 YEARS YOUNG

It is with special pleasure that this photograph of Edith Rotch, W1ZR, of Boston, Mass., is printed, for surely Miss Rotch is a remarkable lady.

Now 84 years young, Edith is the earliest licensed YL who is still active on the air. In 1917 she received a commercial first grade license, and in 1919 she was assigned the amateur call IRO. (8NH, Emma Candler, probably the first licensed YL began operating in Jan. 1915 and Winifred Dow, 7FG, was known as a ham operator before World War I.) A member of the "Greater Boston Spark Coil Club" Edith had a rig on 200 meters and an "umbrella" antenna on the roof. In 1926 she became IZR. During World War I Edith served as a junior inspector in the Signal Corps and during the same period was also code instructor and examining officer at the U. S. Radio School in Boston. Then for nearly twenty years she was an operator with the Postal Telegraph Company. During World War II Edith worked with the Bureau of Standards as a monitor, and later she was one of the first to become a member of MARS.

Now residing in an apartment in Brookline (suburb of Boston) with "no chance for a transmitter," Edith continues to monitor MARS nets. During the summer months she is active on the air from her beach home at Nonquitt, Mass.

A woman of many interests, Edith is a former tennis and ice skating champion. In 1909 and 1910 with partner Hazel Hotchkiss Wightman she won the national ladies doubles championships. She is still a member of the famed Boston Skating Club.

Bouquets to WIZR. Her long, illustrious career is an inspiration!

CAMBRIDGE BOUND JUNE 1960

June 17-19, 1960



For full particulars on registration, reservations, program, etc. for the Third International Convention of the Young Ladies Radio League to be held in Cambridge, Mass., June 17-19, 1960, please see last month's column.

Indications are that there will be an impressive number of YLs converging from all over the country for the year's big YL event. Time is growing short—get your reservations in now.

For the benefit of YLs coming from Chicago westward, K9QGR brings attention to the fact that the New York Central train No. 28 leaves Chicago at 2:40 p.m. Thursday and arrives in Boston at 10:30 a.m. Friday. If thirty or more YLs can make a group reservation, a private car will be available. All interested please contact K9QGR, Hazel Cain, De Witt, Illinois, immediately.

Chances on the unique YL certificate bedspread are still available—again please see last month's column.

If your OM would like a personal introduction to a few hundred YLs (and you would like him to have same), bring him along too. The program committee will see to it that he is well entertained.

Coming Get-Togethers and Events

New England Division ARRL Convention—May 1, New Ocean House, Swampscott, Mass. The Women Radio Operators of New England will conduct a YL meeting. Ladies' prize is a mink stole!

WRONE Annual Spring Luncheon—May 14 at Robinhood's Ten Acres, Route 20, Wayland, Mass. All YLs in New England cordially invited. Plans for YLRL convention in June will be discussed. Luncheon is \$2.50—contact Marie Welsh, WICOL, 1228 Cambridge St., Cambridge 39, Mass.

Midwest YL Convention—The tenth annual will be held in Indianapolis, Ind., May 20-21, at the Mohawk Motel Manor, 5855 E. Washington Street. Registration before May 1 is \$2.00. Hoosier Amateur Woman's Klub is hostess. W9RTH, Adah Elliott, is chairman; K9IXD, "Butch" Singer, is co-chairman. OMs invited.

Third International Convention of the YLRL—June 17-19, 1960, at Cambridge, Mass. (See publicity.)

1960 AWTAR—The 14th annual air derby of women pilots will start at Torrance, Calif., July 9 and will terminate

KN1MJA, 9-year-old Judith Baldwin of Simsbury, Conn., looks happy at the prospect of graduating to the General Class and using something bigger than the 6146 to which she is now restricted. Judy was first licensed when she was eight, and is plugging away on 7 and 21 Mc. Her father is W1IKE.



Sixteen year-old Carol Pilatzke, WV2GKT, of Albany, New York, is a popular YL on 3747 kc. afternoons and evenings. Using an S-38E receiver and running 75 watts from her Globe Chief 90 into an 80 meter longwire, Carol's particular pleasure is a good game of chess on the air. (Photo via K2YTD)

July 13 at Wilmington, Del. Carolyn Currens, W3GTC, chairman of AWTAR radio net, invites YL participation in the net. (See March column.)

Note, please: If you wish a YL get-together or event listed in our "coming calendar," pertinent information must be received at least two months prior to the date of the event.

Teen-age YL Net?

Sixteen year-old Marolyn Gwinn, W8WUB, would like to hear from teen-age YLs interested in starting a teen-age YL net. W8WUB, whose address is 1666-11th Ave., Huntington, W. Va., suggests 20 meters, but other bands can be considered.

Dark Eyed Queen's Certificate

The Chicago YLRL Inc. announces a new award. The Dark Eyed Queen's Certificate will be issued to any amateur who contacts five licensed members of the Chicago YLRL Inc. Club after and including January 1st, 1960. (Net contacts excluded). Send five QSLs showing time, date, A1 or A3, call and band, along with ten cents, to custodian Lillian Rochelle, 3638 Ruby St., Franklin Park, Illinois. Current club members are W9GME, K9CMZ, CQF GUB, JDE, JVL, LIW, LYG, OSS, PDS, and UHD.

QST



May 1960



CONDUCTED BY EDWARD P. TILTON,* W1HDO

WITH the advent of spring and the approach of another v.h.f. DX season, the number of hours devoted to operating on 6 and 2 is bound to rise for most of us. This is going to mean a lot of fun, a chance to boost our states totals — and, in not a few instances, more TVI. Even if your station is capable of getting into a lot of TV sets, you may not encounter much neighbor trouble, so long as you operate only at widely-spaced intervals and for short periods. But when the operating pace picks up, so does the public response.

Of all the questions of a v.h.f. nature answered by the ARRL Technical Information Service, a considerable portion have to do with TVI. Some of these plaintive appeals for help show that the amateur in question has not the foggiest notion of what causes the TVI, or what to do about it. Too often he just lets the situation deteriorate, doing nothing to correct it, or to help his neighbors. When this happens, things are bound to explode eventually — and being able to prove that his transmitter is "clean" will be no solution to the mess he is in by then.

It may be true that the transmitter is not at fault, but nothing is gained by jumping up and down and declaring this fact in angry terms. For some years now, TVI (all kinds) has been far more a public relations problem than a technical one. We know that TVI can be cured, and that oftentimes the cure must be applied at the receiver end. But your neighbor doesn't know it, and you will get nowhere in convincing him, unless you are willing to lean over backward in the matter of neighborly cooperation.

Rule 1: Don't let TVI drag on. If you know that you have it, get to work. You have to convince the TV owner that you are at least as interested as he is in clearing up the trouble. You can't just pawn the job off on some TV serviceman.

Rule 2: Never lose your temper. Once you and your neighbor start shouting at each other you're done for. No matter how angry he gets, you must keep cool. Better yet, keep friendly.

Rule 3: Learn the causes and cures of TVI. Be sure that you know what is actually causing the trouble, and that you know how to fix it. If you just got your ticket yesterday this may not be easy — but if you don't know how to do the job, nobody else is going to do it for you. The set owner and the TV serviceman will almost certainly be of no help. The initiative and the know-how must come from you.

We're not advising you to take on the work of fixing all the TV sets in the neighborhood, but you can install a stub or a filter, to show where

V.H.F. Editor, *QST*.

the trouble lies. If you don't want to so much as look at a neighbor's receiver, take one of your own along. Portables compact enough to be carried around for this purpose are everywhere today. There is nothing like a demonstration of the cure to convince a doubting neighbor.

There are many forms of v.h.f. TVI, but probably 90 per cent lies in one or more of the following categories:

Overloading — This is the source of most 50-Mc. TVI, and the receiver is the culprit. It is a certainty on Channel 2, at close range, and is common on all low channels. It may show as modulation bars, with no carrier interference, or the picture may be messed up whenever the carrier is on the air. The cure is quarter-wave open stub or high-pass filter on the receiver. Where the picture is clear until the 50-Mc. rig is modulated, going to f.m. or c.w. will usually take care of the trouble. Reducing transmitter power and raising the antenna are often helpful.

Image Response — Another Channel 2 problem, but for 2-meter men. Common in TV sets with high-frequency i.f. system, which means most recent production. A stub or a tuned trap on the receiver is usually effective. Not so widespread as the overloading cited above, but likely to be troublesome in congested weak-signal areas.

Audio — Where voice interference not due to the above causes appears, it is usually due to direct pickup by receiver audio circuits. Independent of channel, it is usually heard regardless of the receiver audio gain setting. It occurs in all kinds of audio amplifiers, and embarrassing effects develop with hearing aids and p.a. systems. Cure: Keep the modulated r.f. out of the audio circuits. See any *ARRL Handbook*. Use of f.m. or c.w. is a sure cure; this is purely an a.m. problem.

There is not room here to go into these and other TVI problems of the v.h.f. operator in full detail. The whole story has been told in *QST* many times (see bibliography) and the basic information is in all modern editions of the *ARRL Handbook*. Digesting it is not a task for some afternoon when you have ten minutes to spare. TVI is not that simple, and neither is amateur radio. The fellow who feels that he is qualified to make his own way in the world above 50 Mc. once he has learned which way to throw the send-receive switch on a Communicator is only kidding himself, and inviting trouble. Hamming is a technical hobby.

Here are some *QST* and *Handbook* references to get you started. The rest is up to you.

V.H.F. TVI Prevention and Cure — *ARRL Handbook*, introductory portion of Chapter 17.

Specific techniques discussed in Chapter 23.

TVI Hints for the V.H.F. Man—April, 1953, *QST*.** Much of this information is also in the *Handbook* in condensed form.

50-Mc. TVI—Its Causes and Cures—A must article for the 6-meter operator, by W2IDZ—June and July, 1954, *QST*.

Antenna Couplers for 50 and 144 Mc.—July, 1956, *QST*.** Similar information in *Handbook*, Chapter 17.

V.H.F. TVI Hints—May, 1959, *QST*, p. 79.**

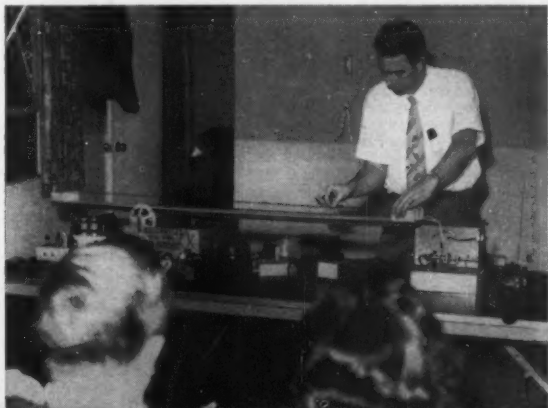
The above are just some of the articles dealing with the v.h.f. aspects of the TVI situation. Much of v.h.f. TVI follows theory and practice common on lower frequencies, and the scores of *QST* articles dealing with lower bands can be read with profit by the v.h.f. man.

Here and There

The night of March 15 brought one of the most widespread aurora openings on record. Signals were very strong on 50 and 144 Mc. throughout the early evening hours, and indications are that considerable work might have been possible on 220 Mc. if more fellows had been trying.

** Issues so marked are still available from ARRL Headquarters at 50 cents, post paid. Photocopies of any article can be supplied at a cost of 25 cents per page.

The 420-Mc. simple-gear project of the Ramona Radio Club (see OES Notes, April *QST*) is catching on. Here Clair Kirk, W6ORS, demonstrates Lecher Wire technique, and shows off some of the gear at the March meeting of the Monterey Park Amateur Radio Club. That there was interest is shown by the crowd gathered around the demonstration table after the talk was over. At the left is Ray Meyers, W6MLZ, ARRL Director, Southwestern Division. W6ORS stands with back to the camera (dark coat) explaining the fine points of the 420-Mc. equipment.



Seldom has anyone covered more territory on 144 Mc. during a single aurora than did W0BFB, Mitchellville, Iowa, in this one. John discovered the aurora at 1820 CST. He worked W4LTU, Springfield, Va., W1JDF, Methuen, Mass., K2IEJ, Oceanside, N. Y., W8WNM, Canton, Ohio, W1MMN, Orange, Vt. W1IZY, Middleboro, Mass., W9LYA/9, W8AQ, Wadsworth, Ohio, and W0AZT, Denver, Colo., and heard W1RJA, Milford, Conn., W7JRG, Billings, Mont., and many nearer stations between then and 2100 CST. This represents 1180 miles to the east, and 800 to the west.

This was only the second aurora that W7JRG had experienced on 144 Mc. Ken worked W0MOX, Boulder, Colo., W0AZT, W0ENC, Rapid City, S. Dak., W0YSJ, Fargo, N. Dak., and heard W0BJV, Watertown, S. Dak.

We have no 144-Mc. reports from farther west than W7JRG and W0AZT, but W7EGN, Whitefish, Mont., worked several Montana, Oregon and Washington stations on 50-Mc. c.w., between 1930 and 2300 MST. The time spread is of interest here. The peak of the aurora for the Eastern Seaboard seemed to be between 1945 and 2015 EST. Judging from the reports we have on file the peak followed sun time to the west, though there was a period around 2130 EST when auroral contacts were being made from ocean to ocean. The best DX we know of is the Winnipeg area, heard by several W1s on 50 Mc.

Through the courtesy of W1VP, your conductor had a chance to talk with Fletchers Ice Island on 20 the next day. We learned from W1JD there that he had been at the helm of KG1FN the previous evening. Teletype stations near the 50-Mc. band edge were strong, but no amateur signals were heard. There was no lack of trying at this end on 50 Mc. Long after all but a few weak aurora signals

50 Mc. WAS

1 W6ZJB	19 W3OJU	38 W7ILL	57 W1SUZ
2 W6BJV	20 W6TMI**	39 W6DDX	58 W1AEP*
3 W6CJS	21 K6EDX	40 W6DD	59 W6LFH
4 W5AJD	22 W6SWF*	41 K6DXT	60 W6LZ**
5 W6ZHL	23 W6ORE	42 W6ABN**	61 W7MAH
6 W9OCA	24 W9ALU	43 W6BAZ	62 W6ESZ
7 W6OB	25 W6CMS*	44 VE3AET	63 W2BYM
8 W6INI	26 W6MVG	45 W9JFP	64 W7ACD
9 W1HDD	27 W6CNM	46 W6QIN	65 K6PYH*
10 W5MJD	28 W1VNH	47 W6WWN	66 W4HOB
11 W2IDZ	29 W6OLY	48 K6ETD	67 K6JJA
12 W1LL	30 W7HEA	49 W6FKY	68 K6RNQ**
13 W6DZM	31 K6COG	50 W6LPD	69 W6QWI*
14 W6HVV	32 W7FFE	51 W6ZTW	70 W6EDC**
15 W6WKB	33 W6PFP	52 W6GCG	71 K6VLM**
16 W6SMJ	34 W6BJJ*	53 W2RGV	72 K6GOX**
17 W6QGW	35 W2MEU	54 W1DEI	73 W6EDM
18 W7ERA	36 W1CLS	55 W1HOY	74 W9JCI
	37 W6PUZ	56 W6ANN	75 W6LLU*

* 49 states ** 50 states

VE7CN	45 VE1HS	41 ZE2JV	26 LA7Y	20
KL7AU	44 ZS3G	32 LU9MA	26 VQ2PL	18
VE1EF	42 SM6ANR	30 CTICO	24 JARAQ	18
XE1GE	39 CU2ZX	30 CO6VW	21 JASBU	17
ZE2AOM	38 SM7ZN	29 LA07	21 JA1AAT	17
KH6UK	37 PZ1AE	28 LU3DCA	21 JA1AUB	16
E12W	37 SM6BTT	29 SM5CHH	20 VP5FP	7

were gone from the 6-meter band, the dihardes were still aiming north and calling CQ at frequent intervals, but nothing came of it.

Our last report from KG1FN, at this writing, was on March 18. Still no amateur signals had been heard from farther away than Anchorage, though KL7AUV was workable nearly every night. This is a distance of some 750 miles. TV Channel 2 from Anchorage was heard quite consistently, and interference from unknown other occupants of Channel 2 was observed. The teletype signals near the band edge, presumably the Alaskan CAA stations often heard here during high m.u.f. periods, are in frequently at T3, indicating that 50-Mc. DX of considerable magnitude should be workable in the far north, if there were only activity in the right places. At last report it was expected that KG1FN would be off the air at the end of March.

Skeds were being kept with several KL7s on 144 Mc., without result. KL7CLH at Tanana, just about in the center of Alaska, has high power and a big beam on 144 Mc. He has worked Fairbanks, about 90 miles, which is the Alaskan 2-meter record at the moment. KL7s CWO CUH and BKB are also in business, and have been trying for contact with KG1FN. Tanana to T3 is about 450 miles.

Trans-equatorial propagation was brisk on 50 Mc. in February. XE1GE found the band open to Argentina 9 times, and also worked HC1FS twice. PY3GK worked 50-Mc. DX 21 days in February. LU2FAO and LU8EX worked DX almost every day, mostly to Caribbean islands, Mexico and South American countries. Several of our Latin American reporters heard or worked K7ALE Feb. 19, and KH6s made their first appearance in several months Feb. 22. It is of interest to see KH6UK on the worked list again. A new country on 6, reported by LU3EX and LU3DCA is Martinique, represented by FM7WU and FM7YC. PZ1AE found the band open almost every day, but only once to this country. Rene worked K4EBO W4PNS and W4AYV Feb. 14.

In other parts of the world there was mixed opinion as to the state of 30-Mc. DX. The ZC4WR-ZE2JV circuit (28-50 Mc.) worked nightly, but Asia to Australia was all but out of business. VK6BE and several other Western Australia operators heard Russian TV on 49.75 Mc. Feb. 21, and BE was able to make out a picture at times. G4LX reports reception of K2MUB K1DIT and W1LGE Feb. 1 at 1900 GMT. He caught ZE2JV on Feb. 4 and 14—probably the longest T8 circuit to function in 1960.

LU3DCA wonders why so few of the amateurs in the Caribbean area are interested in 30-Mc. work. For several months in the year, and for a considerable portion of the sunspot cycle, 6 is an almost ideal band for work over this path. Band openings are a nightly affair, and signals are strong and relatively QRM-free. Puerto Rico to Argentina communication could hardly be better than it is much of the time on 30 Mc.

Some of us on 6 miss out on chances for rare DX because of careless operating habits. No less a DX prize than ZS3G has gone begging on occasion. Bramie writes that he heard U. S. stations several times during the fall of 1959,

usually around 1900 GMT, but he was not able to attract their attention! ZE2JV found the m.u.f. to New England above 50 Mc. around 1900 GMT Feb. 28, but no amateur signals were heard.

Though it will not reach most readers in time, we pass along the schedule to be kept by K2ETI/MM. Bill will be working on 50 Mc. during a Caribbean cruise, and the following port dates will give an idea of when and where to look for him, for those readers who get the message in time: Curacao May 17, La Guira 18, Aruba 19, Kingston 21, Nassau 23, Port Everglades 24. He will not, of course, be operating while in these ports.

Anyone interested in scatter schedules on 50 Mc.? W1ZIG and K1AII have the Worcester Tech club station, W1YK, running a kilowatt on 50.004, feeding a 6-element Yagi. They are on each Sunday morning, with the beam in a WSW direction, and would be glad to keep specific skeds with interested parties. Address: 329 Morgan Hall, Worcester Polytechnic Institute, Worcester, Mass. Another 50-Mc. man seeking skeds, though in this instance with stations in the extended-local range, is K0MSS, Omaha, Neb.

In an effort to promote use of the upper part of the 50-Mc. band, the Greater Cleveland V.H.F. Club Net is operating on 52.2 Mc., with sessions at 2100 Mondays. K8JHZ says that there are more than 50 active members, so getting one of their certificates should be easy. Work six GCVC members and send contact data to K8IPI, secretary.

Many 50-Mc. operators have learned to use the code effectively through getting into action during aurora openings. The nature of this mode of communication is such that most operators use relatively slow code speeds, so it is as good a place as any to take the big leap. The same could be true of the portion of the 2-meter band above 145 Mc., if more of us would tune there, and the Technician and Novice operators would give their keys a workout. During the March 15 aurora, your conductor several times called a very slow "CQ above 145" but got no takers. K1AFR reports at least two c.w. signals above 145, however. Let's keep looking for them. Several recent 2-meter converts have observed that the c.w. on the low end is a lot faster than they have been accustomed to on 6!

There are some sections of the country that get little representation in these pages, and every so often a resident of such an area writes and asks why we ignore him and his neighbors. The answer is that this department is supposed to be a report of what is going on in the v.h.f. bands. It is made up largely from what we receive in the mails. If you want representation, you have to start the ball rolling. Wherever there is v.h.f. activity, things of interest to others are happening all the time—but you have to tell us! Example: K7GGJ, Yakima, Wash., says that the v.h.f. men in south-central Washington would like it known that they are looking for business on 6. Isolated in most directions by high mountains, they need schedules to work out to appreciable distances. K7GGJ and W7JPA have worked K7BDU, Cornelius, Ore., some 150 miles away, by refraction over the Cascades. W7JPA has worked W7AAD, Hillsboro, Ore., about 10 miles farther. K7DKW, Olympia, 120 miles over the Cascades, comes through to Yakima, even though he is running only a Communicator III. These over-the-mountains contacts show that more work of this sort could be done with proper coordination of effort.

W4IIS, Miami, has been working portable at Lake Placid, Fla., 140 miles north of Miami, at intervals during the winter. Contact with the Miami area has always been possible, even when a halo was used. The trips will be continued at about 3-week intervals, and Walt would like to have the gang keep a lookout for him on 50.25 Mc. With a 4-element beam 195 feet above sea level (high for Florida!) he expects to cover the state handily. Most operation will be on week ends, between 0830 and 1300 EST.

The availability of packaged stations has made it possible for many bedridden hams to enjoy v.h.f. work, and we have reported a number of these in the past. However, two-way work between bedridden hams may be news. W9EGH sends us a clipping showing K9OZH/9, West Suburban Hospital, and K9ABG, confined to his bed in his Chicago home, in contact with each other on 30 Mc.

Anyone in the East who wants to try his luck in reception of ionospheric and meteor scatter on 50 Mc. should look on 50.02 Mc. for W9KMV, Raytown, Mo. Jack has

skeds each Saturday and Sunday morning, as follows: 0800 EST, WHDQ; 0600 W4RMU. At 1500 Saturdays, W1YK. Sundays the W1YK sked is at 0930 EST, and checks are made with K9EID at 1000 and 2200 EST. Sked makes a 5-minute transmission at the start of the sked with WHDQ, and your conductor follows for 5 minutes thereafter, on 50.004. Middle Western stations are invited to follow these tests also, and to report any reception details. W9KMY would like to know how to get answers on c.w., other than on aurora. He checked his log for a recent week end and found that he had called CQ on c.w. 36 times without a single answer!

Planning a trip through Northern New York or Vermont this summer? There are many fine locations in this vacation country for working portable, and there is enough activity on 2 and 6 to make life interesting. WA2GCH, Plattsburg, N. Y., says that there are about 40 stations in the area on 2 and a goodly number on 6. K2MEB and WA2DEC are on 220. The following frequencies are monitored: Plattsburg—146.25 Mc., WA2GCH; Peru—145.8 Mc., K2QPV; Burlington, Vt.—145.8 Mc., W1VSA. On 6, 50.25 Mc. is watched when no general tuning is being done.

Meteor scatter work on 144 Mc. is no U. S. monopoly. G3HBW reports working OE1WJ, Vienna, in the January Quadrantids shower. This is believed to be the first England-Austria 144-Mc. QSO, and it is the 5th m.s. contact in Europe. The others: SM6BTT-HB9RG, in the 1959 Geminids, twice; SM6BTT-OE1WJ, in the 1959 Quadrantids; and HB9RG-OK2VCG, in the 1959 Perseids. G3HBW has a high-power experimental license, so is able to run 800 watts, c.w. on 144 Mc. This feeds four 7-element Yagis in a box configuration.

220 Mc. and Up

G3HBW, quoted just above, has a 432-Mc. setup that will make Americans, with their 50-watt power limit, groan. Arnold runs 600 watts c.w. (400 watts out) on 432, and has an array of 8 9-element Yagis mounted in a common aperture with his 2-meter array. He reports that this arrangement has been highly satisfactory, with no evidence of interaction between the arrays.

Transmitting frequencies at G3HBW are 144.892, 434.638 and 1297.05 Mc. An input of 50 watts is run on 1297 Mc., with output of 15 watts. All bands have temperature-stabilized frequencies. Maximum range of a consistent nature on 432 Mc. seems to be about 200 miles, though DX worked includes DL3YBA, 450 miles, SM7-BAE, 620 miles, and SM6ANR, 645 miles. SM6ANR has been heard weakly on several occasions, since the SS-9 first contact. He was running 75 watts input at the time.

220- and 420-Mc. STANDINGS

220 Mc.

W1AZK	9	3	412	W5RCL	8	5	700
W1HDQ	11	5	430	W6NLZ	5	2	2540
W1OOP	12	4	400	K6GTG	2	2	240
W1RPU	15	5	480	W6MMU	2	2	225
W1UHE	11	4	385	K7ICW	1	1	250
W2AOC	13	5	450	K8AXU	5	6	680
K2AXQ	8	3	230	W81JG	9	5	475
K2CBA	10	4	325	W8LPD	6	4	480
K2DIG	4	3	140	W8NRM	5	4	390
W2DWJ	14	6	740	W8PT	10	5	450
W2DZA	12	5	410	W8SVI	6	4	520
W2NTY	8	4	200	W9AAG	9	4	600
W3AHQ	4	3	180	W9EQC	8	4	740
W3FUY	8	4	296	W9JCS	5	2	340
W3LCC	8	5	300	W9JFP	9	4	540
W3LZD	15	5	425	W9OVL	6	3	475
W3RUE	6	4	225	W9UFD	4	4	605
W3UJC	11	4	400	W9ZIH	5	2	270
W3ZRF	5	4	112	K9DGU	5	3	425
K4TFU	8	4	400	K9TFE	6	3	515
W4UBY	7	5	320	KH6UK	1	1	2540
W4UMF	11	6	320	VE5AIB	7	4	450

420 Mc.

W1HDQ	8	3	210	K2UUR	5	2	110
W1RPU	7	4	410	K3EOF	6	3	250
W1OOP	3	3	390	W3FEY	5	2	225
W1UHE	6	4	430	W4HHK	3	3	520
W2AOD	6	4	290	W4VVE	6	4	410
W2BLV	11	5	360	W5RCL	5	3	600
W2DWJ	6	4	190	W7LHL	2	1	180
K2CBA	5	3	225	W8HCC	3	2	355
W2DZA	5	3	130	W8NRM	3	2	390
W2NTY	3	2	100	W9GAB	7	4	600
W2OTA	6	3	150				

Strange to be quoting European power levels, and dreaming of being able to equal them here!

Should we have a standard calling frequency (or band segment) for 220-Mc. work? Operators in the Los Angeles area have long used the middle of the band for serious DX attempts, because of severe oscillator radiation at the low end from TV receivers running on Channel 7. How about radar QRM? Does experience indicate that a frequency up in the band a way would be better than the low edge in this respect? If so, what part of the band is best?

In the Northeast it has been customary (outside of the Boston area) to use the low edge of the band, but there would seem to be no over-riding reason why we shouldn't move. W2SHU, Rahway, N. J., poses the question in behalf of the Central New Jersey V.H.F. Society, whose

(Continued on page 166)

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked.

W1REZ	32	8	1300	W5SWV	10	3	600
W1AZK	27	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W5YYO	5	3	1330
W1RPU	23	7	1120				
W1AJR	23	7	1130	W6WSQ	14	5	1390
W1MMN	21	7	1090	W6NLZ	12	5	2540
W1HDQ	21	6	1020	W6DNO	9	5	1040
W1IZY	20	7	1180	W6AJF	6	3	800
K1CBQ	19	6	800	W6SVI	5	3	1400
W1AFO	17	6	920	W6MMU	3	2	950
K1AFR	17	6	675				
W1CLH	17	5	450	W7VMP	15	5	1290
				W7JRG	12	5	1040
W2NLY	37	8	1390	W7CJM	5	2	670
W2CKY	37	8	1360	W7LHL	4	2	1050
W2ORL	37	8	1320	W7JLP	4	2	900
K2GOI	33	8	1200	W7UJ	4	2	353
W2AZL	29	8	1050				
W2BLV	27	8	1020	W8KAY	38	8	1020
K2IEJ	26	8	1060	W8SDJ	35	8	960
W2AMJ	25	6	960	W8PT	34	8	985
W2DWJ	23	6	860	W8IFX	34	8	980
K2HOD	23	7	950	W8LOF	33	8	1060
W2PAU	23	6	753	W8AME	32	6	910
W2SMX	22	6	940	W8SVI	30	8	1080
K2CEH	22	8	910	W8SFG	30	8	1000
W2LWL	21	6	700	W8EHW	29	8	860
W2RKG	20	6	700	W8LPD	29	8	850
W2UTL	19	7	830	W8WRN	28	8	980
W2RCV	19	6	720	W8BAX	28	8	960
W2WZR	18	7	1040	W8NOC	26	8	975
W2ESX	18	5	740	W8DXC	26	8	720
K2RLG	17	6	980	W8ILC	25	8	900
				W8JWV	25	8	940
W3RUE	30	8	975	K8AXU	24	8	960
W3TDE	29	8	1050	W8GFN	23	8	540
W3GKF	29	8	1020	W8LYC	21	7	610
W3KCA	28	8	1110	W8BLN	21	7	610
W3SGA	27	7	700	W8GTK	17	7	550
W3EPH	22	8	1000	W8NRM	17	7	550
W3RPU	22	8	960				
W3LNA	21	7	720	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1150
W3LZD	20	7	650	W9GAB	34	9	1075
				W9AAG	32	8	1050
W4HJQ	38	8	1150	W9REM	31	8	850
W4HHK	36	9	1280	W9ZIH	30	8	830
W4ZXL	34	8	950	W9LYC	27	8	950
W4LTU	31	8	1100	W9EQC	27	8	820
W4AO	30	8	1120	W9OJL	26	8	910
W4MKJ	28	8	850	W9ZHL	25	8	700
W4UMF	28	8	1110	W9RPV	25	7	1030
W4VLA	26	8	1000	K9AQP	24	7	900
W4EQM	25	8	1040	W9PHP	24	8	820
W4WNH	24	8	850	W9LF	22	7	825
K4EUS	24	6	765	W9KPS	22	7	690
W4CJY	23	6	725	W9CUX	21	7	800
W4VVE	21	6	720	W9OEV	20	7	750
W4TLV	20	7	1000	W9PMN	19	6	800
W4IKZ	20	6	720	W9ALU	18	7	800
W4OLK	20	6	720				
W4AIB	19	7	840	W9BFB	31	8	1180
W4RMU	18	7	1080	W9SMJ	29	9	1070
W4CPZ	18	6	650	W9HIB	28	8	1050
W4RFR	18	7	820	W9QDH	24	9	1300
W4MDA	17	6	750	W9RUF	23	7	900
K4YUX	16	8	830	W9INL	21	6	830
W4LNG	15	6	1080	W9LOF	21	7	800
				W9TGC	21	7	875
W5RCL	34	9	1215	W9RYG	20	8	925
W5DFU	25	9	1300	W9IC	16	7	1240
W5AJG	25	8	1260	W9IFS	16	6	110
W5LFG	25	7	1000				
W5PZ	24	8	1300	VE3DIR	30	8	1330
W5KTD	23	8	1290	VE3AIB	28	8	1340
W5BWL	21	7	1150	VE3BGN	19	7	790
W5VKH	15	5	720	VE3EDR	17	8	1340
W5FYZ	13	4	735	VE3AQO	17	7	1300
W5ML	12	5	700	VE3HW	15	7	1350
W5BGR	12	5	1390	VE3AOK	15	5	550
W5HEZ	12	5	1250	VE3BPP	14	6	715
W5CVW	11	5	1180	VE7FJ	2	1	365
W5NDE	11	5	625				
W5VY	10	3	1200	KH6UK	1	2	2540



Hints and Kinks

For the Experimenter



MOUNTING AIR-WOUND COILS

SINCE I did not have a cone insulator I was unable to mount an air-wound coil the accepted way. I dug into my junk box and found a collection of empty plastic boxes in which screws, bolts and ceramic capacitors come. After removing several of the box tops I sandwiched them

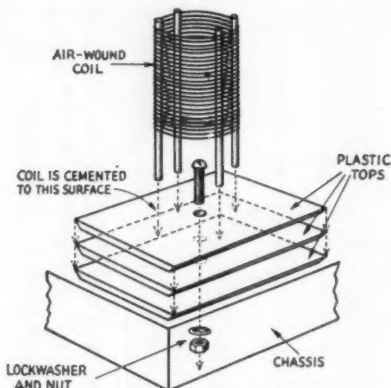


Fig. 1—Sketch showing WA6DUW's method of mounting air-wound coils.

together and fixed them to the chassis with a machine screw and bolt. Then, with model airplane glue I cemented the plastic bars on the coil to the plastic base material. The sketch in Fig. 1 shows the arrangement.

—Eugene Cope, WA6DUW

HAIR CURLER HEAT SINK

THE sketch in Fig. 2 shows a heat sink for protecting resistors, transistors and diodes during soldering. The device is one of those patented hair-curler gadgets. The one I have was purchased in a local 5 and 10 cent store and is made

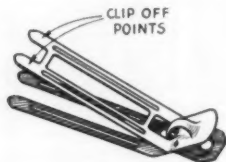


Fig. 2—W4ZM's hair curler heat sink

of aluminum. The fingers of the curler are hinged and spring-loaded and grasp the lead of the component to be protected.

—Edmund B. Redington, W4ZM

ANTENNA ROTATOR HINT

WHEN you're having trouble with commercial antenna rotators you should first check the capacitor that is usually located in the control box before climbing the antenna tower to check the rotator itself. This capacitor can cause intermittent trouble or can completely disrupt the rotator operation. It's worthwhile checking this component first—it may save some tower climbing!

—Walter Voelker, W3FLC

CABLE TWISTER

WHEN making up two or more wires to form a twisted cable, place the ends of the wires in the chuck of a portable electric drill. Secure the other ends to a fixed object and turn on the drill. It doesn't take long to wind the wires. In fact it's better to operate the drill in spurts so as not to overtwist them!

—Alfred Bogdanoff, K2HIR

MODULATING THE GRID-DIP OSCILLATOR

THE g.d.o. can be made more useful by adding tone modulation. The tone will help to identify the g.d.o. signal and distinguish it from any others that may be present during a test. Also, the modulated signal is useful during receiver alignment. The circuit for a neon-bulb tone modulator is shown in Fig. 3. Few parts are required and they are small enough to be tucked into spaces inside the g.d.o. case.

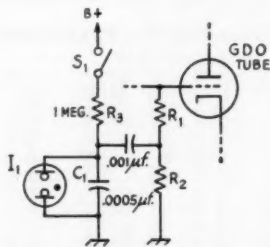


Fig. 3—Circuit diagram of the g.d.o. modulator. See text for information on R_1 , R_2 . I_1 is a neon lamp.

Switch S_1 disconnects the modulator from the g.d.o. power supply. The existing switch on the g.d.o. can be removed and replaced with a multiple contact unit in order to conserve space. Resistor R_1 in the circuit is the existing grid resistor of the g.d.o. R_2 is about $\frac{1}{4}$ the value of R_1 . In order to change the pitch of the tone, juggle the values of C_1 or R_3 .

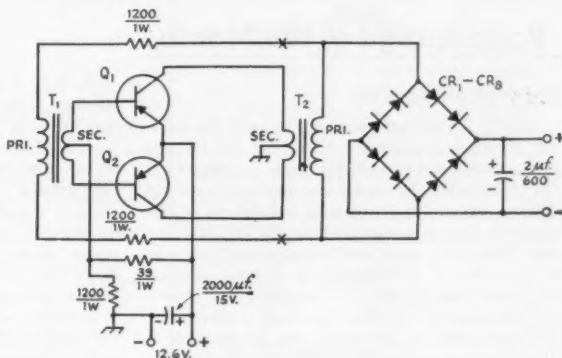
—F. T. Swift, W6CMQ

Fig. 4—Inexpensive transistor power supply.

CR₁-CR₈ inc.—150-ma. rectifier (Sarkes Tarzian M-150 silicon rectifiers).

Q₁, Q₂—Delco 2N173 transistors.

T₁, T₂—Filament transformers, 6.3 volts, 3 amp., center-tapped. (Stancor P-6466).



TRANSISTOR POWER SUPPLY

IN transistor power supplies the most expensive component is usually the power transformer. The supply shown in Fig. 4, above, overcomes this problem by using inexpensive filament transformers. The unit will deliver about 300 volts at 120 ma continuous duty. Although designed for 12-volt d.c. input, the supply will operate from 6 volts d.c. Of course, the output will be cut in half when operation is from 6 volts.

I built my supply in a 4 × 3 × 6-inch chassis. A heat-sink channel (see Fig. 5 below), made from

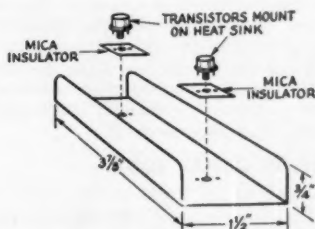


Fig. 5—The heat-sink channel is made from sheet aluminum. Transistors must be electrically insulated from the sink.

aluminum is mounted atop a 4 × 6-inch cover plate which has the two transformers and resistors (supported by terminal tie points) connected underneath. The silicon diodes, input and output terminals, and the filter capacitor are all mounted inside the chassis. Layout is not critical and components can be located at will.

After wiring and checking the unit, apply power. If the supply fails to oscillate, reverse the leads at points X-X in Fig. 4.

—Robert A. Finch, K9IWI

COPPER SHEET SOURCE

COPPER sheeting for use in shields or low inductance v.h.f. leads can be obtained inexpensively from an arts and crafts supply store. The sheeting can be cut with scissors, shapes easily and can be soldered with a conventional soldering iron.

—Julian N. Jablin, W2QPQ

TALK-IN ON FREQUENCY WITH THE GSB-100

THE effectiveness of the CALIBRATE function of the Gonset GSB-100 transmitter can be improved by a very simple change in the wiring associated with the FUNCTION switch. Normally, the CALIBRATE position disables the modulator circuits so that only an unmodulated signal is available for calibration purposes. The changes described here add modulation so that relatively greater accuracy is attained in zero beating.

Wire a jumper from terminal 9 to terminal 8 or 10 on switch S_{2C}. On section S_{2A}, remove the connections from terminals 2 and 8. Tape the ends of the removed wires and leave them in place so that the transmitter can be restored to its original circuitry if desired.

—Grant N. Nickerson, W1RWD

COLORED TAPE FOR IDENTIFICATION

COLORED adhesive bandages can be cut into various sizes and shapes and used for identifying such things as cable connectors, cable ends, antennas, etc. Outlets and test-point jacks can also be identified by this method.

The bandages come in several colors—red, yellow, blue and white—and some are even marked with stars and other emblems. Conventional black plastic tape can be used to indicate ground.

—Dr. Maurice I. Sasson, W2JAJ

REDUCING THE NOISE FIGURE OF PENTODE AMPLIFIERS

RECENTLY I ran across a method of reducing the noise figure of a pentode v.h.f. amplifier. It involves the use of feedback in the screen circuit of the tube and reduces the effect of partition noise. On a 6AK5 amplifier operating on 6 meters, I was able to reduce the noise figure about one db. by connecting a ten-turn coil, 1/8 inch in diameter between the 6AK5 screen and the screen by pass capacitor. Those interested in pursuing this technique further can find information on the subject in the book *Noise*, by Van Der Ziel, published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

—Robert F. Schuetz, W2BDG

Happenings of the Month

AMATEUR GROWTH

Passing the 200,000 mark in October, the number of amateur stations licensed by the Federal Communications Commission grew to 205,000 at the end of 1959. As some amateurs have a second station license the number of individuals in the amateur service is slightly less, 200,000 at year-end. The yearly growth of the amateur body was on the order of 15,000 persons. Actually, during the year some 34,000 new licenses of all classes were issued by FCC, but two-thirds of these were Novices, many of which do not graduate to a higher grade at the end of their one-year term.

HONDURAS THIRD-PARTY TRAFFIC

Effective March 17, an exchange of notes between the governments of Honduras and the United States was concluded providing that amateurs of each country may exchange messages on behalf of third parties. The agreement contains the usual broad restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in actual emergency. The full list of countries with which U. S. amateurs may freely handle such personal unimportant traffic internationally is: Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Peru and Venezuela.

STAFF NOTES

We welcome to the ARRL Hq. Ten-Year Club our newest member, Lewis G. McCoy, W1ICP, *QST* Technical Assistant. Actually, "Mac" completed his ten years last September, but formal recognition of his entry into the club was withheld until the League's delegation returned from the Geneva conference.

"Mac" came to the League as Assistant Communications Manager — Phone, after considerable experience as W9FHZ and W0ICP in the mid-west, particularly in traffic-handling on various

section phone nets. One of his extra duties at Hq. was handling TVI problems, and with his transfer to the Technical Department in 1951 many of his appearances before convention and local club groups were based on the elaborate demonstration of television interference which helped so many amateurs to get "out of the woods" in our most pressing problem at that time. As every *QST* reader knows, he has specialized in recent years in the beginner field, helping the newcomers over rough spots by means of regular articles describing simple and economical equipment and antennas, and as part of the Technical Information Service he also inherits all of the correspondence arriving at Hq. seeking answers to problems which have newcomers stumped. An ardent DXer (242 countries), "Mac" is somewhat more interested in dits and dahs than when he first came to West Hartford, and is currently mastering the technique of a TO electronic keyer.

144 MC. ARMY USE

During the two weeks between May 7 and 21 the U. S. Army will be conducting large-scale maneuvers, under the key name "Elk Horn," near Yakima, Washington. Because many additional frequencies will be needed for the communications system supporting this operation, the Army has requested permission to use eight channels in our 144-148-Mc. band. To this proposal the FCC has offered no objection, but there is an express understanding that no interference will be caused to amateur activity.

14 MC. IN CANAL ZONE

Amateurs in the Canal Zone, who are under military rather than FCC jurisdiction, have been granted an expansion of their 14-Mc. voice band, effective April 1, up to the top limit of the band. The phone subband there is now 14,150-14,350 kc.

ARRL staff members joined in welcoming Lewis G. McCoy, W1ICP, to the Ten-Year Club. L. to r. seated: Miriam Knapp, W1ZIM, secretary, Technical Department; Treasurer and Circulation Manager David H. Houghton; Technical Director George Grammer, W1DF; "Mac"; General Manager A. L. Budlong, W1BUD; Leitha Phillips, billing clerk; Vice-President and Communications Manager F. E. Handy, W1BDI; Doreen Cromarty, circulation clerk; Lillian M. Salter, W1ZJE, Administrative Aide, Communications Department; former accountant Alice V. Scanlan (retired); Samuel K. Cowles, traffic manager, Circulation Department. Standing: Asst. Circulation Manager Joseph A. Moskey, W1JMY; Frank Higgins, building custodian; Asst. Technical Editors Byron Goodman, W1DX, and Donald H. Mix, W1TS; Edgar D. Collins, Advertising Assistant; National Emergency Coordinator George Hart, W1NJM; Advertising Manager L. A. Morrow, W1VG; W1AW Chief Attendant Murray Powell, W1QIS; V.H.F. Editor Edward P. Tilton, W1HDQ. Unable to be present: Marion Bayrer and Cecilia Hatch, circulation assistants; Charlotte Clark, bookkeeper; Asst. General Manager John Huntton, W1LVQ.



MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 273
March 21, 1960

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met at the headquarters office of the League in West Hartford, Connecticut, at 11:15 A.M., March 21, 1960. Present: President Goodwin L. Dosland, in the Chair; Vice-President Percy C. Noble; General Manager A. L. Budlong; Directors Milton E. Chaffee, John G. Doyle, and Morton B. Kahn; Vice-President F. E. Handy and Treasurer David H. Houghton. Assistant Secretary Perry F. Williams and, by invitation of the chair, former Communications Manager Fred Schnell, W4CF, were also present.

The Committee first took up a proposed amendment to FCC rules to permit U. S. civilians overseas to apply for Conditional Class licenses regardless of the distance of their permanent home address from FCC examining points. The General Manager pointed out that civilians overseas who are fortunate enough to maintain a residence more than 75 miles from an examining point may apply for a license while those living closer are not eligible under the present language of sections 12.21 and 12.44. Upon motion of Mr. Doyle, it was unanimously VOTED that, under the provisions of Article 7 of the Articles of Association, the following resolution is submitted to the Board of Directors for mail vote:

"RESOLVED, that the General Manager is instructed to petition FCC for rulemaking to amend Section 12.21 by adding the following language: '... or any citizen temporarily resident, for a reasonable period, outside the jurisdiction of the Federal Communications Commission and who maintains a legal residence within the United States, its territories or possessions, without regard for the distance of such legal residence from the Commission examination points listed elsewhere in this Chapter. (Note: Nothing in this section may be construed as authorizing Commission licensees to operate within the jurisdiction of a foreign government except in accordance with the provisions of sections 12.90 and 12.91 of this Part.)' and to amend section 12.44 in similar fashion."

Upon motion of Mr. Noble, it was unanimously VOTED that the Committee ratifies its mail action authorizing an additional expenditure of \$545.80 to reimburse SCMs and QSL Managers for certain travel in furthering ARRL organizational activities during 1959.

Upon motion of Mr. Doyle, it was unanimously VOTED that the Committee ratifies its mail actions approving the holding of an ARRL Oregon State Convention at Portland, Oregon, April 30-May 1, 1960 and an ARRL West Gulf Division Convention at Dallas, Texas, June 18-19, 1960.

Upon motion of Mr. Chaffee, it was unanimously VOTED to approve the holding of an ARRL Southeastern Division Convention at Atlanta, Georgia, June 4-5, 1960, and an ARRL Delta Division Convention at Chattanooga, Tennessee, April 7-9, 1961.

Upon motion of Mr. Doyle, it was unanimously VOTED that the Committee ratify its mail action affiliating the following clubs:

Eastern Pennsylvania Amateurs... Havertown, Pa.
Gloucester County Amateur Radio Club... Glassboro, N. J.
Medford Amateur Radio Association... Medford, Mass.
Mineral Wells Amateur Radio Club... Mineral Wells, Texas
Mummy Mountain Radio Club... Scottsdale, Arizona
Porterville Amateur Radio Club... Porterville, California
Propagation Unlimited... Clearwater, Florida
Radons... Lancaster, New York
South Eastern Illinois Ham Society, Inc... Carmi, Illinois
Wapsie Radio Club... Independence, Iowa

Upon motion of Mr. Kahn, League affiliation was unanimously GRANTED to the following societies:

Acadia Amateur Radio Club... Crowley, La.
Badger VHF Club of Milwaukee... Milwaukee, Wis.
The Bushwick High School Amateur Radio Club... Brooklyn, N. Y.
Butler Senior High School Amateur Radio Club... Butler, Pa.

FAMILY MEMBERSHIP

For families with two or more amateurs, ARRL By-Laws provide that, after one individual has become a Full Member of the League at the regular dues rate (\$5 in the U. S.), additional amateur members of that family may join the League for a special dues rate of \$1, with all rights and privileges except the receipt of additional copies of QST. Our correspondence indicates some misunderstanding of this arrangement. Please note:

1) All participants in the Family Membership plan must be Full Members — i.e., holders of amateur license. Unlicensed persons do not qualify.

2) There must be an immediate family relationship — i.e., husband or wife, brother or sister, father or mother, son or daughter.

3) The rate for the initial membership is the standard \$5 (\$5.25 in Canada). The rate for additional amateur members of the family is \$1 — not \$2 as many seem to believe.

4) All Family Memberships must be concurrent — i.e., expire in the same month.

So if you are part of a ham family, slip in an extra dollar for each other ham in your clan next time you renew your League membership.

The Calumet Amateur Radio Club... Whiting, Ind.
Edna High School Radio Club... Edna, Texas
Free State Amateur Radio Club... Fort George G. Meade, Md.
Freehold Regional High School Radio Club... Freehold, N. J.
Las Vegas High School Amateur Radio Club... Las Vegas, Nev.
Lincoln Amateur Radio Assn., Inc... Lincoln, R. I.
Michigan Tech. Amateur Radio Club... Houghton, Mich.
Muskogee Amateur Radio Club... Muskogee, Okla.
Spring Hill Amateur Radio Society... Mobile, Ala.
Stuyvesant High School Radio Club... New York, N. Y.
Twin Sault Radio Club... Sault Ste. Marie, Mich.
Wheaton Community High School Radio Club... Wheaton, Ill.
Spud Pickers Amateur Radio Klub... Loring A.F.B., Maine

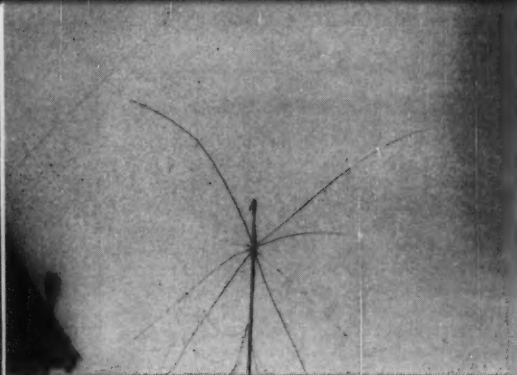
After discussion, on the motion of Mr. Kahn, it was unanimously VOTED that the affiliation of the Fordham Radio Club be terminated and its charter recalled under the terms of the rules and regulations concerning affiliated societies, because of its publication and dissemination of literature inappropriate and objectionable to amateur radio.

Without action the Committee discussed at length a number of business and administrative matters, during the course of which the committee was recessed for lunch from 12:13 to 1:57 P.M.

The President announced the appointment of Mr. Chaffee as chairman of the Housing Committee and Mr. Kahn as a member of the committee. He also announced the appointment of Mr. Kahn as chairman of the Planning Committee, and Mr. Croesley a member of that committee.

There being no further business, the Committee adjourned at 4:16 P.M.

A. L. BUDLONG
Secretary



Antenna used at VU2ANI.

Andaman Island Expedition

BY LES KING*, VU2AK

THIS expedition, like others, suffered many teething troubles before it got underway. Suffice it to say that after getting through red tape in clearing the equipment loaned by Ted Henry and Hygain, having members drop out, and having passage difficulties at the last minute, we finally made it to the Andaman Islands for 30 days.

How It Started

While tuning over the 14-Mc. band on the 22nd of September, 1959, I heard Raju (VU2NR) and Cal (YA1IW) in a huddle over the proposed expedition. As I myself had tried to make it with Kab (VU2BK) in 1956, I had all the dope on the subject, and I could not help but break in on the QSO. I was immediately asked to join and expedite the formalities all round, as I was in the capital.

Unfortunately, Cal was unable to make it, and Rao (VU2RM) very readily joined. Later on we learned that he too had been wanting to make the same trip for some time past. It was indeed a case of "all's well that ends well." The entire expedition was air-planned not only amongst the team members, but with Bob (MP4BCC) back to 'W'-land with Walter (W3RIS) to get all the gear through in time.

The Way Out

The difficulty for the call sign was finally sorted out, VU2ANI was allotted to me, and my own call was suspended for the duration of the expedition. We now decided to meet at Madras on December 23, 1959, and get the *M.V. Nicobar* to Port Blair via Car Nicobar Island. Thus for the first time the three met as a team, when Raju and Rao met me at Madras along with other hams. Raju had got in earlier to do the spade work at Madras, and so duly armed with health certificates and the other gear (32V-2) loaned by Western Zone ARSI and my own homebrew rig, we finally boarded the ship on Dec. 26 at 1430 hours. Raju has a powerful voice, but he nearly lost it in an effort to keep the porters from dropping our gear into the Bay of Bengal. We pulled out at 1600 hours sharp, and headed out to Car Nicobar.

We were soon in a huddle planning the QTH

*% ARSI, Box 524, New Delhi.

and working out details for the aeriels, but the sea began to get rough that night. On Dec. 28 and 29 we hit real bad weather, and in the process found that along with the crew, we were the only ones who were not seasick. The meals were boring, for in the dining room only the team of VU2ANI made it daily. Because of this foul weather we lost a day and eventually made Car Nicobar in the early hours of the 31st, and spent the day there. We wondered how many hams must be looking out for us, as we were behind schedule. We left Car Nicobar, a very beautiful and picturesque coral island, at 1700 that evening. That night much planning was done.

We arose at 0500 on January 1 to notice that we were now passing the small islands south of our QTH, namely The Sisters and Rutland. By 1000 Ross Island was in view and we knew at last that just beyond this was Port Blair. We made it by 1100 and cleared the docks by noon. Raju's work had proved effective and many friends met us and we were soon moved to our QTH.

Meals, baths, etc. were all forgotten, for straight off the gear was opened and a half-wave put up on 14 Mc. At 1400 we gave our first call and 4S7BC came back to us. VU2RA was next and with one accord we at last said, "We have made it! VU2ANI is on the air."

On The Islands

The scenic beauty of these islands must be seen to be appreciated. It is a very pretty spot indeed, with the numerous green islands, hills shrouded in white clouds, and the deep blue of the ocean encircling them. They are covered with thick equatorial forests, and some of the trees are of majestic height.

We soon marred the landscape with a 40-foot 2" pipe to take Raju's "Andaman Octopus," which we hauled up on Jan. 6.

Yes, fellows, see the photograph and you know the secret. On the spider which we brought in with us the cubical quad was built. It took 6 days of waiting to get the correct bamboos from the forest on another island. On this tri-band job we worked 125 countries, and 3360 QSOs. It sure performed for us.

Now back to our task. From the time we fired up, it was a case of working, calling and working. Sometimes we were called even when we had not

fired up and were just monitoring the bands. Rao's "bug" and right hand have never worked faster and his operating procedure was superb. He shelled them as one would peas at more than a QSO a minute. Excitement was great, and it was good to hear the boys from the mainland also. By Jan. 15, we had worked DXCC.

We were plagued for schedules, but could not bind ourselves down as conditions were very peculiar. The best that we could do for the sake of everyone was to listen in on 20, 15 and 10 and work as the bands opened up our way. Sunday mornings we kept for VU hams and home schedules after which we took time off for sight-seeing and Corby's beach.

Conditions

The 14-Mc. band turned out to be the most reliable, while 28 was grim, and gave us only a few breaks to Europe. The 21-Mc. band gave us some very good openings towards Europe. On those evenings it was indeed a pleasure to turn the beam that way and give the boys what they had been patiently waiting for so long.

When we heard JAs working Gs in the afternoon on 10 and 15, we could not hear a squeak. Yet at 1500 IST we picked up a KL7 on 20. Schedules therefore, as previously stated, could not be laid on. VKs/ZLs always roared in, just as the Ws. QRM was very rough and we tried to work as many as we could possibly pull through. We used a NC-240S and a BC-348, sometimes feeding the output from the latter into the National. Rao's converter for 21/28 did its stuff, though its looks may have put us all off.

The Way Back

We reluctantly pulled the big switch with our last contact with W3CRA on Jan. 29, wished all our new found friends luck, and got the gear packed up well in time to catch the ship on Jan. 30 for Calcutta. The journey back was uneventful, and the sea as calm as a duck pond. We reached Calcutta on the morning of Feb. 2, from where the gang broke up to hit their respective ways back home. I did 5600 miles and enjoyed every bit of it, for it was the first ever VU expedition and we certainly learned a great deal.

Conclusion

I desire to thank ARSI, Western Zone, W6UOU, W3RIS, W8PQQ, KH6OR, MP4BCC, Hygain and all those unknown who helped us with gear and support to make the expedition a great success.

I am also sorry for all the sleepless nights we must have caused to some hams, till VU2ANI was in the bag. I guess there was local QRM too from the XYL side.

Note

QSLs are being printed by ARSI as per their latest decision, and we will QSL 100%. Please send all your cards to QSL Manager, ARSI, Box 534, New Delhi, India. Any nonreceipt may please be taken up with the undersigned % the above QTH.

Only these cards will be treated as genuine by our Society. All Societies are being informed accordingly, officially, and remember the call sign is plain VU2ANI, nothing else. QST

Strays

"Tain't true that a Novice can't snag DX, says K2OWJ — he notes that WV2FNP, now WA2FNP, QSOd VK3XB on 7153 kc. last August during summer QRN, QSB and QRM. FNP was using an S38-E receiver with a 10-foot wire for an antenna and a DX-20 to a 40-meter dipole.

Fewer CQs and more listening was the trick, says K2OWJ.

K6QQH worked K0ERP the other day and discovered his nickname was Wyatt — of course. The formal name is Donald O'Brien.



Cy Jenks, W8JYJ, left, has been awarded the Cosmo G. Calkins Memorial Award for his services to amateur radio. W8JYJ operated nearly 1500 hours last year in contact with the South Pole, relaying messages between the men and their families. He has made the same contacts for service men in Guam, Greenland and the Marshall Islands. He devoted more than 200 hours for civil defense and is E.C. and R.O. for Washtenaw County. He is active in RACES, AREC and the Huron Valley Amateur Radio Assn. and has held his present call for 34 years. He was first licensed in 1910 as 8RF. The award was presented by Currin L. Skutt, W8FSZ.

U. S. Armed Forces personnel dig in rubble left by earthquake in Agadir, Morocco looking for survivors.
(Official U. S. Navy photo)

Amateurs at Agadir

BY R. R. HAY,* W4LW

DURING the night of Monday, February 29, 1960 a severe earthquake leveled the city of Agadir, Morocco, leaving an estimated 12,000 dead and 35,000 homeless. Rescue forces of many nations rushed to the scene. As in so many other disasters, amateur radio was there with emergency communications.

By Tuesday afternoon, it was seen that a radio link was needed between the U. S. Navy base at Port Lyautey and Agadir in order to coordinate the movement of aircraft, men and supplies. A Navy CB at Port Lyautey, Chief Petty Officer Bill Wright, was asked if he could get his amateur station, CN8GJ, aboard a plane within an hour. With the assistance of another CB, Equipment Operator Walt Jones, CN8GI, the entire station, including a 38-foot mast, was removed from Bill's home and taken by truck to the waiting plane. Bill and Walt did some hurried packing of personal effects and were ready to go within 45 minutes after they were first notified.

At Agadir, CN8GJ was set up at the French Naval Air Station. Electric power was obtained from an emergency generator set up by the French Navy. This generator also supplied the lights for the hangars, which were being used as hospitals, and supported the equipment in the airfield control tower.

There is a well organized emergency net in Morocco, patterned after the AREC. In addition to the hams at Port Lyautey, CN8JD, CN8HQ, and CN8IP work from the U. S. Naval Communication Facility at Sidi Yahia while CN8FT covers the U. S. Air Force Liaison Office at Rabat. When the first call went out from CN8GJ at 0023 on Wednesday, CN8FY acknowledged on the emergency net's primary frequency of 7070 kc. The first message from Agadir was a request to the U. S. Naval Air Facility, Port Lyautey, for more aircraft.

*Capt., USN, % FPO New York.

For the next 16 hours, CN8GJ and CN8FY were the only link between Agadir and Port Lyautey. Traffic involved aircraft movements, evacuation of personnel, and bringing in food, water, medical supplies, rescue equipment and rescue workers. Inquiries for the whereabouts of various individuals were handled. Fortunately, in all instances except one, it was possible to pass the word that they were safe.

The Port Lyautey end of the circuit was covered by Lieutenant Commander Dave Minton (WA2EVV) and Chief Warrant Officer John Morford (K3CFH). Dave's wife reports that, from Tuesday morning to Friday night, he had about six and one half hours of sleep. John's sleeping hours were about the same. At Agadir, Bill and Walt each got about four hours of interrupted sleep between Tuesday morning and Saturday morning. When asked how they managed to keep going, the reply was "Well, there was a job to be done and somebody had to stay on the rig, so we stayed with it."

On the second day, Pete Nissen, CN8JR, a storekeeper at the U. S. Military Sea Transport Service office in Casablanca, moved a rig into Agadir with the assistance of some French amateurs. In the first two days they handled about 1600 messages pertaining to deaths and injuries. These messages were passed to Radio Morocco for broadcasting to anxious friends and relatives. Pete's ability to speak French and Arabic was invaluable for this job.

Andre Coulon, CN8AR, at Casablanca, is the president of the Amateur Radio Club of Morocco. He took on the job of policing the band in the vicinity of 7070 kc. and warning off interfering stations. His action was of considerable help, as interference was a continual problem.

The traffic handled between Agadir and Port Lyautey was vital to the flow of supplies, aircraft, equipment and personnel which were con-

U. S. Navy personnel from NAS, Port Lyautey, Kenitra, Morocco, man an Emergency Communications station in Agadir, Morocco during earthquake rescue work. Chief Petty Officer Bill Wright, USN CN8GJ (left) and Chief Petty Officer Walt Jones, USN, CN8GI (K1JAA).
(Official U. S. Navy photo)

QST for

tributed to the disaster effort. As some indication of the size of the task, there were 261 aircraft movements, 737 persons evacuated and 1,273,755 pounds of air cargo lifted. The Commander, U. S. Naval Activities, Port Lyautey, says that he believes amateur radio operation was one of the primary factors in the success of the rescue effort. One of the first official reports from Agadir included this statement: "We have established an amateur radio contact which provides direct communication to the scene." A later report said: "We have reaffirmed the need in the disaster area for c.w. communication capabilities which have proved invaluable during the entire operation."

Amateurs everywhere may take inspiration and guidance from the Agadir operations. AREC training and ham ingenuity are the type of background that prompted the radio operators in Morocco. Bill Wright CN8GJ, from St. Louis,

Michigan, was converted to amateur radio at Port Lyautey two and one half years ago after being able to talk to his wife across the Atlantic Ocean. Walt Jones, K1JAA, from Preston, Connecticut, became interested in amateur radio while wintering in at Little America in 1956. Dave Minton, of Forest City, Missouri, had worked c.w. from military aircraft but was finally persuaded to get his amateur ticket by Romolo Preis, K2DU, in Lakehurst, New Jersey. Dave's last stateside call was WA2EVV. John Morford, of Miami, Florida, has been a ham for over 20 years. His last U. S. station was K3CFH, Washington, D. C.

When the call comes for AREC or Annual Field Day participation, remember that some day when disaster strikes *you may be there*. Now is the time to get acquainted with the problems and learn how to cope with them as the amateurs did at Agadir. QST

Strays

Want the dope on postage rates to all countries? Get the free pamphlet *International Mail* from your postmaster, suggests KL7CVI.

Byron C. Sharpe, W9JKC, is collecting names of Rotarians who are amateurs. He would like QSL cards from Rotarian hams, listing calls of any other Rotarian hams they know. His QTH is 634 Vernon Ave., Glencoe, Ill.

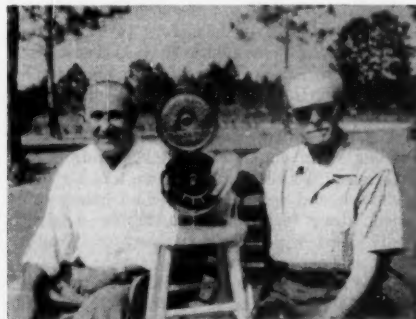
Our youngest ORS? KØRTI is eleven years old.

PERE ET FILS — W1SON of Norwell, Mass., found his CQ answered one morning by K4DAD of Stuart, Fla. . . . DAD is only 17 while SON is 52.

Every October for the past three years, KØAXY, a patient in St. Joseph's Hill Infirmary at Eureka, Ill., has been counting Q5 s.s.b. and a.m. signals

on the 10, 15, 20, 40 and 80 meter phone bands. He has tuned up and down the bands, at all hours of the day and night, making 3,000 signal counts. KØAXY, who hasn't even seen an s.s.b. transmitter and is strictly an a.m. man, is convinced that s.s.b. is the coming thing in hamdom. And he's already planning more listening and more chart-making from his hospital bed next October to prove it.

Hundreds of California youngsters QSO'd Santa Claus this last Christmas — with a little help from members of the Hayward (Calif.) Radio Club. The children chatted with Santa from K6EAG, a special station set up at the Montgomery Ward San Leandro branch store. Club members took turns operating the station and playing Santa from various home rigs. The idea came from K6QXR and K6SWY carried it to Ward's management. W6RJW played Santa on opening night.



Three old-timers on display. Left to right: Les Benson, WØZB/K4HWF, a gold-plated Benwood rotary quenched gap, and Bill Woods, W4AL. This is the original Benwood rotary quenched gap, designed by the two gentlemen above.



All one happy family—the Shanks family of Richland, Washington. They all qualified for their Novice tickets at the same time and were assigned the block of calls KN7KSE through KN7KSL. Above, left to right, KN7KSG, KN7KSL, KN7KSE, KN7KSF, and KN7KSH.



The Unfortunate Ones

BY PAUL AMIS,* W7RGL

THE man to feel sorry for in Amateur Radio is the Non-DXer. There is nothing that will provide a clutch to the throat, or dew to the eye as quick as to see one quietly rag-chewing on 80 meters on a cold, clear winter's night, or relaxing in front of the TV during the DX contest. Hamming is ashes to them; there's nothing but more time for experimenting, more money to spend on fishing, and a lot less North and South paths to sweat over.

They get so selfish and underwhelmed in their non-predatory operating that you are forced to weep for them. No clobbering each other over a couple of kc. at the low end; no bashing each other with a kw. whilst tracking some DX; and missing all the fun of developing nervous hysteria over each mail delivery.

The poor non-DXers go along on the air, discussing gardening with a ham in the next state, ridiculing s.s.b. on the 75-meter phone net, handling traffic with the station across town, and liking ham radio. It's a pretty pathetic picture.

Every ham should chase DX. No one should be allowed to escape the wonderful experience attached to each facet in developing a DXCC. The happy memories of stalking the far-off DX that wouldn't come back; the alert hours scanning the band for an opening, only to find out later that it went wild 15 minutes after you pulled the big switch; the OO card for that combination of wee click plus out-of-band operation; the never-arriving QSL cards; the astounding price of high power components; the flared nostrils of the XYL when you dive into the shack for a DX session Saturday morning; the keeping awake at work the morning after the night before when the band was hot; the rusting fishing tackle; the remoteness of TV-owning neighbors; the middle-age spread.

The real fulfillment comes as your DX stature grows like a little acorn and you become a full-fledged nut; the wonder of watching your new tri-band beam, \$100 rotator, and bulk of your 80-foot tower create a graceful arc as it settles through your living room roof during a wind-storm; the warm glow that filled your being when you missed attending your daughter's wedding to

chase and finally work that rare country, and the additional warmth when you discovered that this particular DX hasn't QSLed *anyone* for 7 years; that feeling of "togetherness" you experienced the time you and your wife were on opposite ends of a 300-foot length of #10 Copperweld you were uncoiling for your new "V"-Beam, and she inadvertently let go; the contemplation of the ostensible ultimate you experienced as your family extricated you from the wire by cutting the entire length into 3-foot chunks with a pair of lineman's pliers. I pity the ham who never runs his sensitivity control past receiver noise, and who listens for W7s instead of 4X4s.

How dismally sterile is the peaceful shack without the cigar box full of IRSs, the \$18.00 yearly subscription to the *Callbook* so as to keep abreast of the vagaries of DX QTHs, the homey essence of a combination of over-heated plate transformer insulation and re-charred cigarette butts, the row of pre-selectors, filters, boosters, broad-band amplifiers, and outboard slicers needed to assure continual DX reception, (and incidentally empower each local to come through like well-placed blows to the temple), all topped off with a fine web of coax, rhombic transmission line, Twin-Lead, and bankruptcy, knitting the whole into orderly chaos.

How about that unique feeling of reward which came when you had spent two hours and thirty-four minutes stalking that AC4, outwaiting the entire pack, only to loose him to "Ol' Buddy" who moved the DX to a local phone band for a long rag-chew? Or the time you kept getting reports of distortion and "garbage-grinding" and could only get replies from the s.s.b. gang? Remember how you tore the a.m. modulator and speech amplifier into their component atoms looking for the trouble — only to finally discover a tightly snubbed-up "Granny Knot" in your mike cable?

These are the times that a DX man treasures, those poignant moments captured forever and held in the heart, together with a tie by the right eye.

Think back to the fateful evening when that DXpedition finally came back to you just before your son turned on the electric drill in the base-

*Route 1, Box 438, Poulabo, Washington.

ment and wiped out the entire band. What non-DXer ever shared in the stark realism of such high drama? Aren't you a better ham for having lived so richly, so fully, and acquiring that peptic ulcer?

Can a man without the DX fever touch the strength of heroism of yourself when the "bitter half" flatly threatened to leave you if you didn't absent yourself from the operating table immediately, concurrently with the ZD7 you'd been calling coming back to you? It takes true spirit to weigh the results, and flip the transmit switch.

The non-DXer lives in an electronic vacuum. He fills his operational hours with sociability,

ease, laughter, friendliness, and money. He contributes no addition to the DX bands — which is a blessing in itself. There is a wearisome emptiness to hamming without DX — and the non-DXer is too tranquil and unruffled to know it. You just have to look at them to see what the years have done. They look youthful, unlined, rested, with an easy laugh and a faultless digestion. It isn't natural. If they only knew the delights of chasing DX, they would look like the rest of us — tired and sagging, gray, deeply lined from too much hunching over hot receivers, and not enough sunshine. In other words —
NORMAL!

QST

"Dit-Dit"

BY AL BROGDON,* W4UWA/K3KMO

ALL I can say is you fellows at Hq. sure don't keep the ARRL literature up to date as far as Operating Signals is concerned. I'm talking about the signal that goes "Dit-dididit-dit, dit-dit."

Back when I was a Novice, this was the Novice ending signal. You want an example?

WN4UVU (after final transmission): Dit-dididit-dit.

WN4UWA: Dit-dit. Dit-dididit-dit.

WN4UVU: Dit-dit.

And this ended the contact.

(For the benefit of any phone men who are still trying to figure out the dits, may I explain that this is not pure Morse code, but the rhythm to "shave and a haircut, bay rum.")

Anyway, I was visiting a Novice buddy recently, and I saw him using this same old signal in a new and different way. I rushed back to my own shack and tuned the Novice bands — high, low and 40 meters. All the Novices were using this signal in the same way.

This is the way my buddy would use the signal. He would scan the band, just listening, with his hand poised over the J-38 knob. He would come across a station sending "dit-dididit-dit." Then my buddy would send "dit-dit." If the first station didn't respond to that, he would tune on and look for others. Eventually, he would find a station that would respond like this:

Unknown Station: Dit dididit-dit.

My Novice Buddy: Dit-dit.

Unknown Station: Dit-dit.

My Novice Buddy: Dit-dididit-dit.

Unknown Station: Dit-dit. Dit-dididit-dit.

My Novice Buddy: Dit-dit de KN4 —

Unknown Station: KN4 — de KN3 — R TNX FR CL, etc.

ARRL, do you see what this "dit-dididit-dit, dit-dit" is? It's the Novice Call. For many years, the General Class amateurs have had

* 316 W. Fairmount Ave., State College, Pa.

"CQ — the General Call." Now the Novices have "ESE-EE — the Novice Call." You fellows at Hq. better see that this gets included in all the literature under "Operating Signals" from now on.

These Novices may not even realize it, but they are using break-in. At the usual Novice power level (75 to 100 watts input), all that is necessary to use full break-in is either a t. r. switch, or separate receiving and transmitting antennas.

So why don't they use their break-in capability in the standard manner? Call a short call, until they get a reply. I would call a short call anything this short or shorter:

CQ CQ CQ CQ de KN4 --- KN4 --- KN4 --- BK.

Oh, well, it's like the fellow told me, "Cheer up. Things could be worse." So I cheered up, and sure enough, things got worse.

Postscript

This is addressed toward the Novices in the reading audience.

Although I may seem to have been critical of Novices, it is meant to be constructive. I am "for" Novices 100% — I don't think the class of license should be removed from the present license structure — I don't even think Novices should stay out of the 15-meter phone DX band. I think they should use any and all of their privileges as they desire.

However, I am agin "Creeping Lidism" — to include long calls (either with or without signing), bug-pushers at 10 w.p.m. with their bugs set at 20 w.p.m. ("Name hr is 606," etc.), and people who take the same amount of time to tune a two-stage c.w. rig that is normally used to tune WRCA-TV for a color telecast.

My friends, why don't you try short CQs with break-in operation, and see if it isn't as good as ESE-EE.

QST



Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

GENEVA POSTSCRIPTS

☞ I have just read with much interest the article on "The Geneva Radio Conference" published in the March edition of *QST*.

As you have known for a long time, the Navy has always been interested in the amateurs and in assuring that their interests in matters of radio frequency allocation are not jeopardized. The aforementioned article is an excellent rundown on the background and the current international status of the amateur bands. The hard work of the U. S. Delegation, particularly of Mr. Huntoon and yourself, was rewarded well by the final results achieved on behalf of the amateurs. I made about a one-week stop in Geneva during the conference and know firsthand the amount of long, hard work such a conference involves. (You may recall we met at the coffee counter briefly.) Please accept my congratulations for publishing such a fine article.
—Frank Virden, Rear Admiral, U. S. Navy, Director, Naval Communications, Washington, D. C.

☞ Reading the very complete and comprehensive report of proceedings at the Geneva Radio Conference in the March issue of *QST*, North American radio amateurs can realize how very fortunate, indeed, they are to have an organization as powerful, and as competent and respected, as the ARRL to represent them at such a vital world conference.

If nothing else except preparation for, and participation in, these radio conferences was done by the ARRL on behalf of its members, membership would still be a gilt-edged investment. What price would any amateur willingly pay to prevent the loss of, say, 200 kilocycles out of the 80 meter band, or a slice out of "20"?

It may happen some day, but a strong and determined delegation such as those organized by ARRL will postpone that day to the utmost. —W. A. Seawright, VESCE, Ontario.

MORE ON NOVICES

☞ . . . In answer to all the letters, both pro and con to my previous letter which appeared in January *QST*, I would like to register my firm standing with K5JMY who states, "we all know it is ridiculously easy . . . with absolutely no real knowledge of radio or electronics whatsoever to get a Novice license." And so it is, I firmly believe that amateur radio is for only the people who prove themselves worthy of it.

Perhaps another idea, though much less effective, would be this: let the Novice license stand as is. The only change would be that the General would be issued for a period of, say, three years, and could not be renewed. The only possible course after this would be to try for the Amateur Extra Class license which would last a period of five years and renewable, of course. The only difference here, I would suggest, would be that all amateurs should take a retest, both theory and c.w., every five years. I'm sure that this would surely put all amateurs on the ball and only those which have a real knowledge of radio and capable of high c.w. speeds would remain on the bands (and a good way to reduce the number on the air) . . . —Peter V. Guidi, WA2BMB, Croton Falls, New York.

☞ Let's give hearty congratulations to WA2BMB for his fine letter regarding the elimination of Novices (January, 1960). To his noteworthy suggestions, I would like to make a few additions.

The first of these erudite proposals would be a most beneficial one: discard all drivers, education courses, thereby alleviating our crowded highway situation. The second of these sagacious bits of wisdom would be to remove ele-

mentary education. This would give us more room for our already overcrowded high schools.

I hope the President or someone of equally important stature reads this. Maybe we'll have some quick action.
—R. G. Robbins, K3HTB, Newark, Delaware.

☞ After reading WA2BMB's letter (January *QST*) and the comments (March issue), I would like to offer this solution to the crowded band condition.

- 1. Eliminate "store bought" equipment from the bands. (This will quiet things considerably.)
- 2. Eliminate all calls with prefixes such as WA, KN, and K. (This solves WA2BMB's problem.)
- 3. Eliminate all three-letter W calls. (This takes care of me.)
- 4. Raise the code speed requirements to 35 wpm. (This takes care of everybody.)
- 5. Make reexamination required every 2 years. (This takes care of the guys who boast, "It's been so long since I took the exam I doubt if I could pass it.")
- 6. Give the whole mess to W1FH and W6AM. (This will give us a pretty good representation on either coast for foreign ops who want to work the U. S.)
—James R. Berry, W0PYI, Boonville, Mo.

☞ There have been letters in *QST* praising, condemning, complaining, boosting, and boasting this and that but far too many complaining about the "other guy."

The writer is not new in radio having graduated from the spark coil and crystal thru the rock crusher and the tube transmitter with absorption loop modulation, experiments with carbon arc modulation, naval operation on every type of craft, deep sea operator, broadcast, in fact thru the whole string since 1915. Now in later years after 35 in the broadcast field back to ham radio with a commercial rig at home and mobile in the car which is getting hard use.

What is wrong with amateur radio? Nothing. The editors of *QST* do a fine job—the directors of ARRL do a fine job and there seems to be something for everyone. There may be things that some do not like. So what? Let them go about their favorite pastime be it contests, experimenting, building or buying or just being interested. There is something for everyone. Personally my opinion is that there is no finer bunch of men and boys than in amateur radio. For myself every contact is enjoyed, every ham is a friend, every contact is a thrill. In what other hobby is it possible to find a kindred spirit in almost every town? In what other hobby do you have a common meeting ground whether your ham is a millionaire or a bus boy, a mechanic or a doctor?

Let us all enjoy our hobby. There is room for every class. I have never met an amateur I did not like on the air or face to face. —Bert Wick, K8SOE, Devils Lake, N. D.

ADVERTISING PAYS

☞ Like a lot of families, ours takes a whale of a lot of magazines, but after some twenty years of reading *QST*, I've discovered that, in all that time, it still is the only publication I've ever received with continuing interest and enthusiasm. It is also the only magazine in my reading experience in which I read all the advertisements in every issue. I can't afford to buy very much, but when I do, I surely know where it's sold, how it's made, if it works, and how much it costs.

It takes me about a month to get through an issue, so figuring twelve a year, over a period of time it works out to a great deal of continuous entertainment, doesn't it? Thanks for the many ARRL services I've enjoyed with others for so many years. —John K. Munroe, W7KCN, Lummi Island, Washington.

CALL LETTER PLATES

Our courthouse is located in the City of Davenport which is the county seat of Scott County, Iowa. Here in the state of Iowa each of the ninety-nine county treasurers' offices is charged with the duty of registering motor vehicles within its county and issuing the license plates.

At the last session of our state legislature a law was passed permitting the manufacture and issuance of special call letter plates to be mounted on both front and rear of the automobiles owned and driven by qualified amateur radio operators. To date, we have issued sixty-two sets of these special plates for our county.

Most of us certainly are aware of the many benefits during normal times which accrue to an area by having a good organization of active amateur radio operators and can readily realize the inestimable value of such an organization during periods of distress. This gives us an opportunity to compliment our organization in this district as all of the men with whom we have come in contact have been high calibre men, the type with whom it is a pleasure to do business. Amateur operator K0AGJ has been especially helpful to us as it was he who, in advance of the big rush in our auto license department in December, thoroughly explained to the operators the details of the registration law as it applies to the special license plates. As I mentioned before, while this has been our first year in handling these special registrations, everything has gone along smoothly and certainly when the opportunity presents itself I shall be pleased to thank each of these amateur radio operators personally. — *Ted G. Goodwin, Scott County Treasurer, Davenport, Iowa.*

OOTC

It might be of interest to some of your readers to know that the Old Old Timers Club, which was founded in 1947, has become increasingly active, and is eager to welcome those qualified to join.

To quote Article VIII of the Constitution:

"Any amateur wireless operator who holds a valid amateur license, and who held a two-way contact over his or her own transmitter and did so make such transmission with some other wireless station, whether amateur, commercial, or naval, at least forty years prior to the date of his or her application, shall be eligible for consideration for membership. Applicant need not have been continuously active in the art during the intervening years."

There are at present about 120 members. Correspondence should be directed to the Secretary-Treasurer, Earl C. Williams, W2EG, Box 462, Asbury Park, N. J.

A members net is held on Thursday evenings, on 3940 kc, with W2EG presiding, at 7:00 E.S.T. — *Stearns Poor, W1FO, Editor, Hanover, Massachusetts.*

TURN IN YOUR BADGE

After reading some recent critics against contests in QST, and especially the ones written by W4EVE in the March issue, I feel I'll have to straighten out some points about it. Enough is enough. First, if Mr. Rappaport knows how contests are run, he must know that A1 and A3 contests are not generally held at the same time, and he can go at the other side of the band if he does not want to join the others. I always could find a quiet spot during contests for an enjoyable QSO. Next, I consider ham radio as a sport, and a sport for me means competition and group spirit, not selfish individualism. If he thinks every contestant is an insane one, where is democracy if one can't compete against others without being treated as ready for an asylum?

Contests are not a question of majority or minority. They are a basic need for men to show their skill and ability towards an unique and common goal. ARRL knows that, and as it's considered as a good thing, it's applied to ham radio as it should. I don't think contests are in excess. They are mostly scheduled at winter time, on some week-ends, and they don't occupy all the frequencies. If Mr. Rappaport is so easily disgusted by contest QRM, I'm afraid he does not really know what amateur radio is, and he should exchange his brand-new rig for a good camera!

If one suggests that I'm a "hello-good-bye" fellow because of my attitude towards contests, he does not know me well. I proudly provided many a guy with a RCC

certificate, and I will continue to have good and long chats with anyone wishing to do so. Besides taking my share of contests, I like to relay traffic from time to time. I learned that, to enjoy ham radio, one must respect the other fellow's point of view and take the good of every part of our splendid hobby. — *Serge Langlois, VE2AWR/VE3JC, Montreal, Quebec, Canada.*

You are to be complimented on selecting red for "DX TEST" on the cover of the February issue. Had it been any other color, I'd have seen red anyway! I would point out that to many of us week ends are the only time we have for a few hours on the air. More and more we find all bands cluttered with the DX hounds and the hello-good-bye contacts.

My complaint is not so much that Hq. sponsors these DX contests as that little seems to have been done to see if the contests, as they are now organized, excluding non-contest minded hams, are the wish of the majority of licensed amateurs. This issue should be settled in the democratic manner, a referendum! Most of those I have talked with feel the same about it as W2ADB. Why not send out a questionnaire? Meanwhile, those with any opinion on the matter, pro or con, why not write in and express your opinion? After all, they aren't mind-readers at Hq. but they do read letters! — *Greg Taggart, VE7BBV, Hazelton, B. C.*

I've noticed in recent issues of QST some letters criticizing contest operation, and laying the blame in part at the ARRL welcome mat for not "respecting the rights of the minority" to part of the ham spectrum (W2SF, Jan.; W2ADB, Feb.; W4EVE, March). I find it awfully hard to believe that even in densely-populated "two-land" many clear segments cannot be found during the peak contest activity. I've gone through many an ARRL fracas in the hotbeds of "six-land," Los Angeles and San Francisco, and have marveled at the lack of activity (contest or otherwise) above 3550 kc, 7080 kc, 14,300 kc, and 28-100 kc, to say nothing of the v.h.f. bands and 160 meters. In the west, most contestants automatically congregate on the low end and any listing of contest sub-bands by the ARRL would be superfluous.

Perhaps these hard-pressed gentlemen are referring to phone, where the spectrum is somewhat more crowded, but then if you insist on using one band and one mode of emission under all circumstances, you must expect some penalty for your lack of flexibility. It is much like using one lens and one type of film to take all pictures you can take! I think the ARRL has very intelligently and thoughtfully organized the contest calendar and I'd like to say "bully" for the League staff — keep up the good work! — *William B. Bridges, W8GB/AF6GB, Berkeley, Calif.*

THE DX "PILEUP"

With the growing number of amateurs in the United States and the skyrocketing interest in DX, the "pile-up" has become more than ever a characteristic of working foreign stations. Contrary to popular belief, there are orderly pileups. If all stations call when they are supposed to, that is when the DX station sends SK or "dit-dit," then it is as close to being sensible as is possible. To lessen QRM, it is very wise to use short calls. A decent rule of operating is to call the DX station three times and to sign your own call three times. Only in the most unusual cases should one call more times than this.

Another practice synonymous with DX is "tail-ending." If the DX station acknowledges "tail-enders," the stations calling should refrain from signing their calls and that of the DX station more than once. An alternate procedure would possibly be to sign one's own call twice, preceded only by DE.

The cardinal rule of working DX is listening. As a matter of fact, it is the most important operating habit to be formed by any operator, DXer or not. Believe me, it is extremely exasperating to be working a DX station and some lid starts to transmit on top of him — and even more so, if this lid is testing or just rag-chewing. After all he has the whole band to chew the rag, but the DX station is on just one frequency.

Remember — working DX is 90 per cent listening. Use your head and increase your country list. — *Francis W. Williams, K4OWT, Winston-Salem, N. C.*

QST



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C. W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

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AREC — A Plan, an Organization, A Way of Thinking. Tennessee SCM, W4UIO, in recently addressing all his ECs, urged each to review community plans and revise them as needed. His remarks are applicable for ECs all over the nation, especially the injunction, about contacting other amateurs: "Most of all, talk AREC at every opportunity; help make AREC a real power." W4UIO's bulletin stresses points of preparation that all amateurs should consider for emergency communications. (1) Within the limits of abilities *improve and expand* station equipment . . . not so much for more power but in terms of having compact equipment, reliable under all conditions, and capable of emergency powered use. (2) The best equipment is worthless unless one through practice (and exercises) develops his skills to operate. These include (1) prudence . . . the art to be quiet, (2) know-how to prepare messages in proper form, (3) facility in right procedures, precise timing of calls, tune-up ability for least interference to others, and the faculty to work well in emergency nets, to transmit, relay, and deliver messages. But let us quote W4UIO's stated philosophy behind his and all AREC operations.

"It has been pointed out by many persons that we have amateur radio because of the public service and emergency communications which we have and will provide. . . . As citizens we use a portion of the spectrum for our personal pleasure and recreation. . . . Our obligation to meet communication emergencies comes also from an entirely different line of thought, our obligation to our Maker and society to help our fellow man as we see and feel the need. . . . We offer our services in amateur radio in the AREC, not altogether from the selfish standpoint of preserving our hobby, but from a sincere desire to help our neighbor. Considered in this way, the obligation to prepare ourselves for emergency communications takes on a more commanding and deeper urgency."

About the BPL and BPL Medallions. The Brass Pounders League currently takes a total of 500 messages handled, or 100 originations-plus-deliveries monthly. All amateurs working voice or c.w. (or both) are invited to participate in net and individual operations and, as they make the grade, are accorded this recognition. Some time ago we took an opinion poll regarding a change of name, but such is the strength of

tradition that even in analyzing the returns from *phone-only* groups, a majority favored continuance "as is."

The conditions under which BPL Traffic Medallions are issued will be repeated for the benefit of new workers in the traffic field. Reports must have been made to the proper SCM in the field organization in the first 7 days of the month following that in which the traffic was handled. Messages must have been handled on *amateur frequencies* and in the proper normal amateur

A.R.R.L. ACTIVITIES CALENDAR

May 5: CP Qualifying Run — W6OWP
May 19: CP Qualifying Run — W1AW
June 1: CP Qualifying Run — W6OWP
June 11-12: V.H.F. QSO Party
June 17: CP Qualifying Run — W1AW
June 25-26: Field Day
Nov. 12-13, 19-20: Sweepstakes Contest

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

Apr. 30-May 1: PACC Contest (c.w.), VERON (p. 66, last month).

Apr. 30-May 1: Delaware QSO Party, Delaware ARC of Wilmington (p. 86, last month).

May 2-4: Operation Alert, OCDM (p. 99, this issue).

May 6-8: West Virginia QSO Party, Mountaineer Amateur Radio Assn. (p. 146, this issue).

May 7-8: PACC Contest (phone), VERON (p. 66, last month).

May 7-8: International Telegraphic Contest, USSR Central Radio Club (p. 66, last month).

May 14-15 and May 28-29: Bermuda-U. S.-Canada Contest, Radio Society of Bermuda (p. 162, this issue).

May 13-15: Nevada QSO Round-up (p. 140, this issue).

May 21: Armed Forces Day Receiving Competition and QSO Party, Dept. of Defense (p. 49, this issue).

Here's one end of that efficient RTTY traffic link to Alaska . . . W6NRM. Note the Model 26 and 15 page-printers. Transmitter, remotely controlled, is in the garage and runs 400 watts to an 813 final; a k.w. job (at W6CQK) can be actuated by a telephone dial system and a transistorized switching circuit.



form as shown in the *Operating an Amateur Radio Station* booklet. Each message counted must have been handled in a 48-hour maximum delay period. Qualification in consecutive months is not necessary, but the following points must be observed.

(1) Only individual amateurs working their own stations are eligible. Club, post-training 602 and other multi-operator stations are not eligible, nor may an amateur receive a medallion on the basis of traffic handled at a station other than his own.

(2) All traffic counting toward the medallion must be duly reported to your SCM and then recorded by him in the BPL column in QST.

(3) Each amateur may receive but one medallion, this on the third time he reports a BPL traffic total and it has appeared in QST. This means that after a third BPL one must allow a two or three month period to permit the actual work to be recorded in QST, before one can receive the award.

Hints to New Netters. ARRL's current Net Directory shows some 516 nets active; many nets this year have had an influx of new reporters, giving added coverage and interest and success in operations. A few ideas on what makes things go well may not be amiss. In reporting into a net, each net member should make it a point always to be on time. This is not only a matter of morale, but also of fairness to other net members. An NCS must have as many cities or points represented in the net as possible to distribute traffic efficiently. One has to make the net "free" and excuse (QNX) the reporters where located at points for which there is no traffic in a reasonable time.

Points to avoid in net operation: (1) excessive calling; (2) too much conversation; (3) excessive speed in transmissions, voice or c.w.; (4) and sending at 15 w.p.m. with bug adjusted to make dots at 55 w.p.m. Speaking of speed, the optimum recommended speed is the maximum at which the other operator can really copy "solid."

In starting messages it is of extreme importance that the originating station secure and send a full and complete address, also to include a check that agrees with the number of words in the text, so none will be added or omitted. The text itself is of no concern to operators, but only to the sender and the addressee . . . in theory anyway. Real dedicated communicators realize this but know that the "apparent importance" of a message may speed it along should it fall into the hands of inexperienced amateur operators.

Interval Timing. Most alert operators don't need any special advice to get in their one-times-

one radio identification, especially if accustomed to good procedure and business-like operation. Voice operators who become sufficiently involved in their casual operating find that they run into discourses and round tables where the passage of time can admittedly get out of hand, as it can also if you have lengthy c.w. traffic or bulletins. Remember to sign each ten minutes in long bulletins or transmissions. A sand filled hour glass good for 10 minutes can be used, but for some time there has been a 10-minute interval timer on the market to help amateur operators to get in their identifications at FCC-required intervals. —F. E. H.

RTTY NOTES

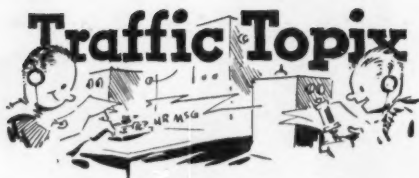
Re RTTY traffic: During the Anchorage Alaska Fur Rendezvous, the traffic originated in Alaska for the other states was fed into the National Traffic System by a highly efficient amateur RTTY link. In the February 17-24 period about 300 messages were sent (60 wpm) from KL7BK (7 Mc.) and KL7MZ (14 Mc.) to W6NRM at Redwood City, Calif. Bob Weibrecht assured himself of clean repeat quality under excellent to marginal conditions by arranging diversity reception. Two BC348Q's with horizontal and vertical antennas were used, and the output fed to two terminal units, a flip flop, and the printer line. Bart, W6OWP on daytime skeds took 63 direct from KL7BK; W6CQK copied 54. From W6NRM the perf'd tape was retransmitted (AFSK) (some by f.s.k. on 3620 kc.) to Bob Mead, K6GZ, whose regular outlets gave admirable service. For a week the KL7 traffic in and out averaged close to fifty messages a day.

Bulletins sent by RTTY: Summarized herewith is some RTTY OBS-schedule information that may be of general interest. This is in addition to regular RTTY net-schedules which often include a bulletin period conducted by an appointee during weekly net sessions.

Day	Time	Freq.	Call
Sun. . . .	1400 PST	7140 kc., 147.3 Mc.	W6MXJ
Tues. . .	2000 PST	7140 kc., 147.8 Mc.	W6AEE
Tues. . .	2015 PST	3620 kc., 144.3 Mc.	VE7KX
Tues. . .	2000 PST	147.7 Mc.	K6BPI
Wed. . .	2000 PST	3620 kc., 147.3 Mc.	W6VPC
Thurs. .	1000 PST	7140 kc., 147.3 Mc.	W6VPC
Fri. . . .	1810 CST	7140 kc.	W5USN
Sat. . . .	1000 PST	29,090 kc.	W6CG
Sat. . . .	1400 PST	7140 kc., 147.3 Mc.	W6MXJ

The Northern California Amateur Radioteletype Society reports the availability of Model 15's in the S.F. area. The membership was 95 as of the end of the year (15 new members in the year). Current officers are W6NKP, Pres.; W6CQI, V.P.; W6VPC, Sec'y-Treas. Periodic meetings are held at the El Rancho Motel (Millbrae). TTY paper, tape, and toroids are held in quantity by the club to assist members.

SCM-appointed ARRL Bulletin Stations, several in each of ARRL's 73 sections, additional to the above and WIAW also transmit A-1 and A-3 radio bulletins of ARRL and FCC information to amateurs daily.



Who was the individual "traffic champ" in 1959? Foolish question! It was W3CUL, of course. Who else? Nobody even came close to Mae's 662 BPL points for the year. Georgie, W2KEB, was a good second with 497, better than second-place calibre ordinarily (she was "top dog" with considerably less than that in 1956 and 1957), and a youngster sporting the call K2UTV came in third with 363 — the first "K" call to make the top ten for any year.

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

In the post-war (since 1946) category, we have W3CUL so far ahead that she could retire and probably retain the same position indefinitely. Mae has amassed a grand total of 4732 BPL points! Compare this with the total of old Ben, W4PL, the dean of all traffic men (1946) and you will get some idea of the amount of traffic passing through W3CUL in the past ten years or so. Georgie, W2KEB, has moved up to third place. Here are the "first 25" in each category:

1959	Post-War (Since 1946)
1. W3CUL (662)	1. W3CUL (4732)
2. W2KEB (497)	2. W4PL (1946)
3. K2UTV (363)	3. W2KEB (1873)
4. W0BDR (287)	4. W7BA (1837)
5. W7BA (281)	5. W0BDR (1721)
6. W0LGG (241)	6. W8CA (1691)
7. W8UPH (209)	7. W9NZZ (1230)
8. W0LCX (178)	8. W3WQ (1184)
9. W0NZZ (173)	9. W8CPI (1099)
10. W6GYH (165)	10. W9JLJ (982)
11. W8CA (163)	11. W6GYH (981)
12. W9DO (160)	12. W9DO (979)
13. W4PL (155)	13. W7PGY (896)
14. W0DYG (154)	14. W7CZY (885)
15. W6EOT (150)	15. W6CE (815)
16. K1BCS (144)	16. W0TQD (809)
17. K6HLR (129)	17. W0LCX (661)
18. K1CIF/MMQ (127)	18. W0PZO (639)
19. W7ZB (115)	19. W2RUF (591)
20. W4SJH (105)	20. W8UPH (524)
21. K0ONK (102)	21. W0LCX (523)
22. W5WCF (102)	22. W4PTU (522)
23. W7BDU (101)	23. W0TTJ (515)
24. K6BPI (99)	24. W2KFV (511)
25. W7PGY (99)	25. W8QXO (479)

Most of the call area leaders can be ascertained from the above. Among the VEs, the leader for 1959 was VE2WT with 44 points; on the basis of his 1959 performance he is also the post-war VE leader. In the post-war category, the following are call area leaders although not among the first 25 in the nation: W1EMG (275); W5RCF (371).

February net reports:

Net	Sessions	Check-ins	Traffic
Eastern Area Slow	29	180	77
TCPN, 2nd Call Area	29	213	186
Mike Farad	21	488	488
Early Bird Transcon	29	...	834
7290	43	1377	937
Hudson	29	406	526
ESN	29	441	564
20 Meter SSB	20	634	2596
TCPN, First Call Area	29	...	2649

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	311	2490	2082	312	5195
K2UTV	213	1568	1381	65	3530
W0LGG	373	1132	1063	67	2635
W4PFC	9	43	1982	40	2074
W8UPH	10	934	840	91	1875
W8CA	28	915	905	4	1832
W0LCX	26	828	755	73	1682
K1MMQ	314	784	510	11	1619
W7BA	19	795	758	32	1608
W0BDR	30	790	699	16	1535
W3IVS	18	746	722	24	1510
W0OHJ	4	711	714	14	1436
W4PL	5	696	594	29	1424
W9MM	12	622	609	23	1266
K1BCS	105	491	398	89	1173
W9DO	26	565	509	48	1148
W4ZCQ	13	545	531	13	1102
W6R8Y	30	568	385	102	1085
K0ONK	42	520	506	14	1082
K3DZB	4	538	527	10	1029
K2YZZ	18	508	487	12	1025
K6PXX	9	498	37	479	1023
W6GYH	63	486	442	24	1015
K6LVR	4	472	405	6	945
K6WAH	41	452	294	158	945
K6HLR	39	462	377	5	883
W6EOT	7	442	403	30	882
K6MCA	110	381	360	13	864
W9DO	19	404	61	362	846
W9JOZ	16	398	415	2	831
W6GOY	317	360	37	42	806
W7DZX	9	402	364	23	798
K4QLG	487	154	60	94	795
K4GFR	496	153	115	30	794
W9JLJ	22	377	187	137	714
K288X	36	370	345	20	771
W8DAE	47	367	210	143	767
W1PDX	19	364	343	13	739
W0GGO	52	360	22	64	738
K2VCO	13	354	312	33	712
K1LSM	9	350	334	16	709
K0UJ	84	272	253	103	692
W9ZYK	20	318	290	63	691
W18MU	31	351	273	18	673
K48JH	85	300	255	10	650
W3VR	51	298	277	12	638
K4KNP	12	333	293	0	638
K68XX	35	306	267	25	633
K2MFF	7	314	281	30	632
W10BR	28	318	277	6	626
W4ZKU	15	300	283	27	625
W8PGW	5	307	301	7	620
W3KUN	23	118	171	291	603
W9IDA	6	304	280	10	600
W9NZZ	173	213	22	192	600
W2EZZ	6	299	286	7	598
W9MAK	27	270	242	4	582
K1WCM	64	256	248	8	576
W9KQD	70	261	220	22	573
K6BPI	15	278	246	32	571
W5BKH	6	273	218	61	558
W52HN	42	259	172	81	554
K4FMA	22	252	191	74	559
W7RDU	0	267	262	2	532
K8JLF	4	261	254	7	526
W3HNC	16	255	250	4	525
VE2WT	108	212	202	0	522
K6OZ	6	257	255	3	511
K1IIC	114	205	186	11	516
W9IMN	126	198	54	134	512
K4GNY	15	229	251	16	511
K5TSL	41	235	220	15	511
W7QLH	14	255	229	11	509
K9GYQ	7	255	233	14	509
W9OMM	38	215	161	92	506

Late Reports:

K0FCT (Jan.)	1880	640	52	406	2978
K0FCC (Jan.)	12	252	248	2	514

More-Than-One Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6YDK	783	426	373	47	1629
W6ZJB	216	307	166	12	701
K5LZW	668	3	...	3	674
W0TUS	86	247	158	31	552
W0ANA	21	252	187	49	509

Late Report:

W6YDK (Jan.)	631	260	201	44	1136
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BPL for 100 or more originations-plus-deliveries²

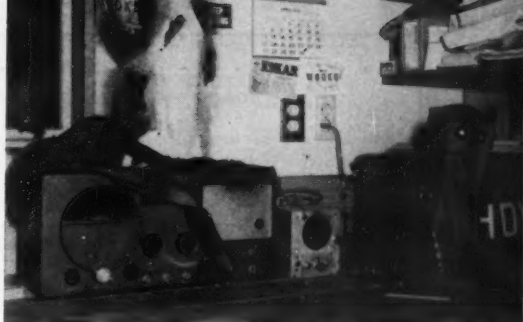
W9GJB 252	W9DGA 127	W1YBH 107
VE2AZL/W1 182	K6EA 124	K9QGO 107
K2DEI 165	K4ILB 121	W3JWN 106
W4ZCNY/VE5 158	K4MJE 119	K4RCP 104
W2VDT 152	W4ZCCF 118	K4M1H 104
K4GBS 148	K9AIR 118	K0RTI 104
K4ODS 146	K5MXX 117	K2YVL 103
W4SHJ 146	K1CIF 109	K4VHC 103
W4ACDD 132	K4CNY 109	K8AOL 102
K7BKH 131	W4BEE 108	KN4LDF 100

More-Than-One Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6YDK	783	426	373	47	1629
W6ZJB	216	307	166	12	701
K5LZW	668	3	...	3	674
W0TUS	86	247	158	31	552
W0ANA	21	252	187	49	509

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

Switch to safety is the watchword of ARRL . . . well how about this! A too hot transformer put the finishing touches on this rig of K4DVL. The mike cover "Hoo-Doo" represents the wise ale bird who "hoots it up" all night. The partially burned "Keep Smiling" sign is quite appropos and that's just what chief op Del is doing . . . with a new Mohawk receiver.



National Traffic System. We think you might be interested in a further report on the "taping" of traffic nets for training purposes, as mentioned in this column in QST for February of this year. The response was interesting and varied, all the way from blanket approval to irate condemnation. Under the circumstances, it's hard to arrive at a consensus, but it does appear that the plan has flaws we hadn't previously considered. For the nonce, therefore, it is being held in abeyance. We aren't abandoning it, but merely putting it aside until we can get a chance to consider ways and means of resolving some of the objections.

The tape of NJN, IRN and EAN mentioned was tried out on some "dogs," as we mentioned. The reaction seemed to depend entirely on the nature and breed of dog. Radio clubs were bored stiff, even those with a preponderance of c.w. men in them. Groups of traffic men, on the other hand, were alertly interested, and already several such groups have requested loan of the tape or copies of it. Only one tape was received from the field as a result of our request in that direction.

Some NTSers took a self-conscious attitude about it all; that is, they didn't like the possibility of their being taped doing something wrong and held up as a bad example. Some even threatened to quit NTS nets. Others questioned the legality of the whole thing in international, federal and state terms. One amateur thought the idea excellent but said we ought to eliminate call letters (now *there's* a good job for someone, but not us). Perhaps what we'll have to do is ask each amateur on the tapes to waive libel and other legal rights before we can use them.

So the idea was simple enough, but in common with most simple ideas it accumulates complications as it develops. If we were addicted to wishful thinking, we could wish that netters would accept any criticism in the constructive spirit in which it is intended and, if they commit *faux pas*, be content to have them pointed out so that others may learn from their mistakes. Whence arises this sense of guilty outrage? Has the fine art of joining the laughter at one's own expense become lost in the jostle for self-justification? February reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
1RN	53	993	.517	18.7	78.7
2RN	58	799	.552	13.8	95.2
3RN	58	805	.440	14.1	96.0
4RN	58	1184	.480	20.4	88.4
RN5	58	991	.434	17.1	89.7
RN6	58	1843	.629	31.8	95.3
RN7	58	924	.369	15.9	46.8
8RN	54	509	.307	9.4	93.2
9RN	51	1484	.833	29.1	76.0
TEN	58	1132	.578	19.5	76.9
ECN	14	103	.329	7.8	88.1 ¹
TWN	50	633	.385	12.7	72.8
EAN	26	1766	1.183	67.9	99.3
CAN	29	1440	.897	49.6	100.0
PAN	29	1804	.808	62.2	100.0
Sections ²	1090	10072		9.2	
TCC Eastern	102 ³	326			
TCC Pacific	111 ³	1851			
Summary	1802	28659	EAN	14.7	PAN/CAN
Record	1521	24106	.978	19.1	100.0

¹ Region net representation based on one session per night or less. Others are based on two or more sessions per night.

² Section nets reporting: EM2N & EMN (Mass.); RIN (R. I.); KYN. (Ky.); TLCN (Iowa); BCEN (B.C.); SCN (S.C.); WIN & WSSN (Wis.); CPN & CN (Conn.); QLN (Ind.); QFN, Gator, Gator SSN, FPTN, TPTN, FMTN (Fla.); VN & VFN (Va.); AENT, AENO, AENP Morn, AENP, AENB (Ala.); E. Tenn.; S. Dak. CW, S. Dak 75 Phone, S. Dak 40 Phone; QKS (Kans.); N. Texas; GSN (Ga.); BUN (Utah); WVN (W.Va.); SCN (Calif.); NEB (Neb.); Iowa 75 Phone; MDDS (Md.-Del.-D.C.); NHN (N.H.).

³ TCC functions reported, not counted as net sessions.

Ho hum. We're so used to beating former records that it would be a great shock to find one not beaten, some month. The day is coming, no doubt, but it's not here yet. We showed a gain of over 1500 sessions and over 4000 messages (not "pieces of traffic") over last February, to once again top all previous records. EAN set a new "rate" record for February. And, although we can't beat the all-time average (set in 1954), we improved on last year's 14.2.

W2PHX reports that 2RN exceeded its December traffic total during February. W3UE begins his fifth year as 3RN manager, and notes that the net is improving all the time. W4SHJ has awarded 4RN certificates to W4s CXY DVT EIN FX NHT VJ, K4s PIA SGQ. W5GY is interested in an outlet for Mexico, traffic for which appears on RN5 once in a while. An RN6 certificate has been awarded to W6AIT, retroactive to 1958; with his February report, K6HLR forwards tabulations for the "RN6 Service award," showing that W6RSY is top man with 1840 points. Manitoba non-representation is a thorn in the side of TEN; W6RDN took over managership duties for a couple of weeks in February while K6KBD was off the air. Unreliability in reporting is the reason for the low number of sessions on ECN. Arizona shows signs of reviving to bring TWN representation up. W9DO is resigning as CAN manager as soon as a suitable replacement can be found. Same applies to W6PLG as PAN manager. Both are finding increased job responsibilities cutting into their NTS time.

Transcontinental Corps. The TCC-Eastern roster is filling up fast. W1SMU is beating the bushes for qualified operator-station combinations. The D function is still the fly in the ointment, coming as it does at a time inconvenient for most operators. TCC-Pacific is also improving as Director W6EOT makes efforts to keep his roster alive and up to date, traffic handled showing a 64% increase over January. TCC certificates have been awarded to KCCLS/6, K9DTEK, W6ATB and W6QMO.

February reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern.....	102	92.2	1566	326
Pacific.....	111	97.3	3698	1851
Summary.....	213	94.8	5264	2177

The TCC roster: Eastern Area (W1SMU, Dir.): W1s SMU AW NJM OBR, K1MMQ, K3s UTV S8X, W3WG, K4KNP, W8PGW, W9s DYG DO; Pacific Area (W6EOT, Dir.): K6s LVR YBV HLR YLS QJB, W6s EOT QMO ELQ HC GID, W6ATB, W7s GMC ZB BDU, K9s DTK EDH EDK CLS/6, W9s ANA KQD.

DX CENTURY CLUB AWARDS

W6AM . . . 297	W6DZZ . . . 292	W6TT . . . 290	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
ZL2GX . . . 297	W6CUQ . . . 292	W8UAS . . . 290	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
W3GHD . . . 297	W4DQH . . . 292	CE3AG . . . 290	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
W1FH . . . 297	W7ANX . . . 292	W1WDD . . . 230	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
W8HGW . . . 297	W7GBW . . . 292	W8DMD . . . 289	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150
W2HUQ . . . 294	W9NDA . . . 291	W8BKP . . . 288	W6BIL . . . 230	SM7ANB . . . 186	W6UNP . . . 145
W8JIN . . . 294	ZL1HY . . . 291	W5ADZ . . . 288	W9FTU . . . 230	W8MCC . . . 184	Z86LV . . . 144
W2CK . . . 293	W1ME . . . 291	W3BES . . . 289	W3LMO . . . 225	W2FZY . . . 182	CX9AJ . . . 143
W6ENV . . . 293	W3JNN . . . 291	W8NNV . . . 288	W6OBH . . . 223	K4LTA . . . 181	EA8RC . . . 141
W6SYG . . . 293	G2PL . . . 291	W6TS . . . 288	W9WFS . . . 222	W7BA . . . 181	K4RJN . . . 140
W4BFD . . . 293	W7CUL . . . 291	W4TM . . . 287	W8B8K . . . 220	G3HJ . . . 177	U30V . . . 135
W2ACW . . . 293	W2BXA . . . 291	W1GKK . . . 287	W7EZK . . . 220	W1VAN . . . 176	ZP3LS . . . 135
W6EBG . . . 293	W3KT . . . 291	Z86BW . . . 287	W10DW . . . 215	W3KHU . . . 173	W1AJQ . . . 132
W8BRA . . . 293	W6ADP . . . 291	W8KOK . . . 287	K2JYH . . . 212	W8LPA . . . 171	KSHY . . . 132
W9YFV . . . 293	W8RRI . . . 291	W1CLX . . . 287	K6RWO . . . 211	H99KC . . . 171	W8CDV . . . 131
KV4AA . . . 292	W5ASG . . . 290	W6MX . . . 286	W1JNV . . . 210	W1BAN . . . 170	KH6EQ . . . 130
G3AAM . . . 292		G4CP . . . 286	W2FXA . . . 210	K4ICK . . . 170	W70QO . . . 130
			W9PTO . . . 210	WAWDI . . . 170	VE3BOR . . . 130
			W8S2S . . . 207	K8IKB . . . 170	SP4EZ . . . 130
			W7AQB . . . 205	VE7CE . . . 170	W1KNU . . . 125
			W4HVQ . . . 203	W5QN . . . 169	W0NGM . . . 125
			W2CGJ . . . 203	W10HA . . . 168	K8LSG . . . 123
			W6BIF . . . 201	K6IYJ . . . 168	DJ2IV . . . 122
			W9HQF . . . 201	W6HYG . . . 164	W1GZP . . . 121
			K2IRO . . . 200	W9BGL . . . 163	K6JBP . . . 121
			D1LGP . . . 200	K2LGN . . . 161	W6WLO . . . 120
			W2RDD . . . 200	W7ABO . . . 160	W8QHW . . . 120
			W4ECI . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8S8U . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8LAV . . . 200	K1CCA . . . 165	K4YCV . . . 119
			DL1DX . . . 200	W6MVL . . . 155	G3DCG . . . 113
			W3JZY . . . 198	SM5AJU . . . 154	G8DI . . . 111
			W91RH . . . 197	VE2BK . . . 152	CX9AJ . . . 111
			H9N0U . . . 194	W5IPR . . . 151	K6OCX . . . 110
			W100S . . . 215		K4JKR . . . 110

Radiotelephone

W6AM . . . 297	W6DZZ . . . 292	W6TT . . . 290	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
ZL2GX . . . 297	W6CUQ . . . 292	W8UAS . . . 290	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
W3GHD . . . 297	W4DQH . . . 292	CE3AG . . . 290	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
W1FH . . . 297	W7ANX . . . 292	W1WDD . . . 230	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
W8HGW . . . 297	W7GBW . . . 292	W8DMD . . . 289	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150
W2HUQ . . . 294	W9NDA . . . 291	W8BKP . . . 288	W6BIL . . . 230	SM7ANB . . . 186	W6UNP . . . 145
W8JIN . . . 294	ZL1HY . . . 291	W5ADZ . . . 288	W9FTU . . . 230	W8MCC . . . 184	Z86LV . . . 144
W2CK . . . 293	W1ME . . . 291	W3BES . . . 289	W3LMO . . . 225	W2FZY . . . 182	CX9AJ . . . 143
W6ENV . . . 293	W3JNN . . . 291	W8NNV . . . 288	W6OBH . . . 223	K4LTA . . . 181	EA8RC . . . 141
W6SYG . . . 293	G2PL . . . 291	W6TS . . . 288	W9WFS . . . 222	W7BA . . . 181	K4RJN . . . 140
W4BFD . . . 293	W7CUL . . . 291	W4TM . . . 287	W8B8K . . . 220	G3HJ . . . 177	U30V . . . 135
W2ACW . . . 293	W2BXA . . . 291	W1GKK . . . 287	W7EZK . . . 220	W1VAN . . . 176	ZP3LS . . . 135
W6EBG . . . 293	W3KT . . . 291	Z86BW . . . 287	W10DW . . . 215	W3KHU . . . 173	W1AJQ . . . 132
W8BRA . . . 293	W6ADP . . . 291	W8KOK . . . 287	K2JYH . . . 212	W8LPA . . . 171	KSHY . . . 132
W9YFV . . . 293	W8RRI . . . 291	W1CLX . . . 287	K6RWO . . . 211	H99KC . . . 171	W8CDV . . . 131
KV4AA . . . 292	W5ASG . . . 290	W6MX . . . 286	W1JNV . . . 210	W1BAN . . . 170	KH6EQ . . . 130
G3AAM . . . 292		G4CP . . . 286	W2FXA . . . 210	K4ICK . . . 170	W70QO . . . 130
			W9PTO . . . 210	WAWDI . . . 170	VE3BOR . . . 130
			W8S2S . . . 207	K8IKB . . . 170	SP4EZ . . . 130
			W7AQB . . . 205	VE7CE . . . 170	W1KNU . . . 125
			W4HVQ . . . 203	W5QN . . . 169	W0NGM . . . 125
			W2CGJ . . . 203	W10HA . . . 168	K8LSG . . . 123
			W6BIF . . . 201	K6IYJ . . . 168	DJ2IV . . . 122
			W9HQF . . . 201	W6HYG . . . 164	W1GZP . . . 121
			K2IRO . . . 200	W9BGL . . . 163	K6JBP . . . 121
			D1LGP . . . 200	K2LGN . . . 161	W6WLO . . . 120
			W2RDD . . . 200	W7ABO . . . 160	W8QHW . . . 120
			W4ECI . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8S8U . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8LAV . . . 200	K1CCA . . . 165	K4YCV . . . 119
			DL1DX . . . 200	W6MVL . . . 155	G3DCG . . . 113
			W3JZY . . . 198	SM5AJU . . . 154	G8DI . . . 111
			W91RH . . . 197	VE2BK . . . 152	CX9AJ . . . 111
			H9N0U . . . 194	W5IPR . . . 151	K6OCX . . . 110
			W100S . . . 215		K4JKR . . . 110

From February 1, to March 1, 1960 DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

K2DCA . . . 259	VE6TP . . . 107	DL9DB . . . 102	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
W2FAR . . . 202	W6LJH . . . 106	W4CQB . . . 101	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
W5PSB . . . 150	DM2AVN . . . 106	K6ANP . . . 101	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
W0TQA . . . 141	FB8CD . . . 106	H99KC . . . 101	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
W4HBJ . . . 140	W5NMS . . . 105	SL5AB . . . 101	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150
W8QWI . . . 128	W5ERM . . . 105	Z8JNJ . . . 101	W6BIL . . . 230	SM7ANB . . . 186	W6UNP . . . 145
E8ABAC . . . 123	JA6TA . . . 105	KN1VT . . . 101	W9FTU . . . 230	W8MCC . . . 184	Z86LV . . . 144
DL9CN . . . 122	PA8DOG . . . 105	W1WJ . . . 100	W3LMO . . . 225	W2FZY . . . 182	CX9AJ . . . 143
K1IEF . . . 121	W5HSR . . . 104	K4MWB . . . 100	W6OBH . . . 223	K4LTA . . . 181	EA8RC . . . 141
K1JDN . . . 121	HBIC . . . 104	W5ANE . . . 100	W9WFS . . . 222	W7BA . . . 181	K4RJN . . . 140
G3KIM . . . 116	W2HUG . . . 103	K6ZMB . . . 100	W7EZK . . . 220	G3HJ . . . 177	U30V . . . 135
CT1SX . . . 114	K4BJ . . . 103	W5AVY . . . 100	W10DW . . . 215	W3KHU . . . 173	W1AJQ . . . 132
W8SCJ . . . 113	W4WBC . . . 103	K8ELT . . . 100	K2JYH . . . 212	W8LPA . . . 171	KSHY . . . 132
W8CRI . . . 110	SM5AE . . . 103	K0MTO . . . 100	K6RWO . . . 211	H99KC . . . 171	W8CDV . . . 131
W6BRE . . . 109	W1CRA . . . 102	VE7ANR . . . 100	W1JNV . . . 210	W1BAN . . . 170	KH6EQ . . . 130
E8JH . . . 109	W7CNL . . . 102	EL4A . . . 100	W2FXA . . . 210	K4ICK . . . 170	W70QO . . . 130
JABAC . . . 108	K8EZD . . . 102	G3JYZ . . . 100	W9PTO . . . 210	WAWDI . . . 170	VE3BOR . . . 130
W6AMO . . . 107		KX6CO . . . 100	W8S2S . . . 207	K8IKB . . . 170	SP4EZ . . . 130

Radiotelephone

W1HJB . . . 181	W2UZP . . . 105	K2OEA . . . 101	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
W8SAI . . . 124	Z86AIA . . . 105	W38CD . . . 100	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
F9IL . . . 112	W0GAA . . . 103	W9FCV . . . 100	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
W2FXN . . . 109	VE6EN . . . 104	DJ2XF . . . 100	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
DL3RK . . . 107	W6HYG . . . 102	XE1SN . . . 100	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150

ENDORSEMENTS

W5KC . . . 280	W4IMI . . . 263	K4GSU . . . 244	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
W0A1W . . . 280	W9UXO . . . 261	W5TIZ . . . 244	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
W9QVZ . . . 280	W2BYU . . . 260	W1QNC . . . 243	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
VK2DI . . . 280	W3RUT . . . 252	W6RLP . . . 243	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
W2GUM . . . 270	W2UVE . . . 251	VE1EP . . . 241	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150
VE7GI . . . 270	W8IRN . . . 251	W2QJM . . . 240	W6BIL . . . 230	SM7ANB . . . 186	W6UNP . . . 145
GM3JST . . . 270	W5FRF . . . 251	W9YNB . . . 240	W9FTU . . . 230	W8MCC . . . 184	Z86LV . . . 144
VE7GI . . . 269	W6WWQ . . . 250	VE3RE . . . 240	W3LMO . . . 225	W2FZY . . . 182	CX9AJ . . . 143
W8KPL . . . 268	W0QGL . . . 246	G8KS . . . 240	W6OBH . . . 223	K4LTA . . . 181	EA8RC . . . 141

Radiotelephone

W6AM . . . 297	W6DZZ . . . 292	W6TT . . . 290	W6BPA . . . 237	W100A . . . 190	W9WNB . . . 151
ZL2GX . . . 297	W6CUQ . . . 292	W8UAS . . . 290	W2FXN . . . 233	W8TUO . . . 190	Z81FD . . . 151
W3GHD . . . 297	W4DQH . . . 292	CE3AG . . . 290	ON4DM . . . 232	W9ALL . . . 190	W2HRR . . . 150
W1FH . . . 297	W7ANX . . . 292	W1WDD . . . 230	W1WDD . . . 230	K8SXA . . . 188	K8KDI . . . 150
W8HGW . . . 297	W7GBW . . . 292	W8DMD . . . 289	K2LWR . . . 230	W8IBX . . . 188	MP4BBE . . . 150
W2HUQ . . . 294	W9NDA . . . 291	W8BKP . . . 288	W6BIL . . . 230	SM7ANB . . . 186	W6UNP . . . 145
W8JIN . . . 294	ZL1HY . . . 291	W5ADZ . . . 288	W9FTU . . . 230	W8MCC . . . 184	Z86LV . . . 144
W2CK . . . 293	W1ME . . . 291	W3BES . . . 289	W3LMO . . . 225	W2FZY . . . 182	CX9AJ . . . 143
W6ENV . . . 293	W3JNN . . . 291	W8NNV . . . 288	W6OBH . . . 223	K4LTA . . . 181	EA8RC . . . 141
W6SYG . . . 293	G2PL . . . 291	W6TS . . . 288	W9WFS . . . 222	W7BA . . . 181	K4RJN . . . 140
W4BFD . . . 293	W7CUL . . . 291	W4TM . . . 287	W8B8K . . . 220	G3HJ . . . 177	U30V . . . 135
W2ACW . . . 293	W2BXA . . . 291	W1GKK . . . 287	W7EZK . . . 220	W1VAN . . . 176	ZP3LS . . . 135
W6EBG . . . 293	W3KT . . . 291	Z86BW . . . 287	W10DW . . . 215	W3KHU . . . 173	W1AJQ . . . 132
W8BRA . . . 293	W6ADP . . . 291	W8KOK . . . 287	K2JYH . . . 212	W8LPA . . . 171	KSHY . . . 132
W9YFV . . . 293	W8RRI . . . 291	W1CLX . . . 287	K6RWO . . . 211	H99KC . . . 171	W8CDV . . . 131
KV4AA . . . 292	W5ASG . . . 290	W6MX . . . 286	W1JNV . . . 210	W1BAN . . . 170	KH6EQ . . . 130
G3AAM . . . 292		G4CP . . . 286	W2FXA . . . 210	K4ICK . . . 170	W70QO . . . 130
			W9PTO . . . 210	WAWDI . . . 170	VE3BOR . . . 130
			W8S2S . . . 207	K8IKB . . . 170	SP4EZ . . . 130
			W7AQB . . . 205	VE7CE . . . 170	W1KNU . . . 125
			W4HVQ . . . 203	W5QN . . . 169	W0NGM . . . 125
			W2CGJ . . . 203	W10HA . . . 168	K8LSG . . . 123
			W6BIF . . . 201	K6IYJ . . . 168	DJ2IV . . . 122
			W9HQF . . . 201	W6HYG . . . 164	W1GZP . . . 121
			K2IRO . . . 200	W9BGL . . . 163	K6JBP . . . 121
			D1LGP . . . 200	K2LGN . . . 161	W6WLO . . . 120
			W2RDD . . . 200	W7ABO . . . 160	W8QHW . . . 120
			W4ECI . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8S8U . . . 200	VE7EH . . . 160	W9WJL . . . 120
			W8LAV . . . 200	K1CCA . . . 165	K4YCV . . . 119
			DL1DX . . . 200	W6MVL . . . 155	G3DCG . . . 113
			W3JZY . . . 198	SM5AJU . . . 154	G8DI . . . 111
			W91RH . . . 197	VE2BK . . . 152	CX9AJ . . . 111
			H9N0U . . . 194	W5IPR . . . 151	K6OCX . . . 110
			W100S . . . 215		K4JKR . . . 110

U.S.-Canada Area and Continental Leaders

KH6L

OPERATION ALERT, 1960

(May 2, 3, 4, 1960)

Just as we were turning in final copy for this issue, we received a letter from W8DUA, OCEM RACES Coordinator, with all available information on OPAL-60. This can serve as nothing but a last-minute notice to all concerned who have not already been informed, inasmuch as state c.d. offices have probably already informed local c.d. directors, and we shall have informed our own emergency coordinators.

Naturally, we amateurs want to cooperate to the utmost in this nationwide exercise, just as OCEM and local and state c.d. organizations assisted us during the SET last year and previous years. The OPAL-60 "standards," while devoted primarily to subjects of little interest to us communicators, has this to say about RACES: "All RACES plans should be put into effect during the exercise. All possible use should be made of RACES nets to provide an opportunity for testing and training of RACES personnel and plans."

In his letter, W8DUA adds these words: "Again this year, we welcome AREC membership participation, in addition to RACES people. It is an excellent time for amateurs to volunteer their services to local authorities, whether already organized or awaiting such an opportunity for their capabilities to be officially recognized."

RACES radio officers and AREC emergency coordinators who have not already done so are urged to get lined up with their c.d. directors or communications officers to discuss their part in the coming exercise. Amateurs not taking part are requested to avoid causing unnecessary interference to RACES nets in operation during the OPAL dates.

Although FCC will conduct a CONELRAD drill during the exercise, amateurs this year are not being requested to report results. Response from amateurs in reporting CONELRAD reception last year was very gratifying. This year, only broadcast stations are required to observe the alert.

Let's have a good showing of amateur participation in Operation Alert 1960.



Browsing through the volume of 1959 QSTs with Annual Report data in mind, we find that during the year only one communications emergency found its way into the 8-point "up front" portion of the magazine. At first impulse, one would think that the QST reporters were off the ball last year. It certainly seems that among the 81 emergencies reported during 1959, at least half a dozen or so would be worthy of up-front treatment.

And so they were. Some of the emergencies were big ones, encompassing a wide area and extensive amateur activity. They should have received more prominent treatment in the magazine. How come they didn't?

Well, to begin with, QST, unlike other magazines, has no reporters—not as such, anyway. As an organ of a membership society, it relies principally on its membership to supply material. That means you, OM. But, like other magazines, QST material has to be readable and presentable. We can edit it for the former, if necessary (within limits), but the type and quality of illustrative matter is something over which we have less control. If "a picture is

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.v. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.

worth a thousand words," then maps, charts and diagrams are worth at least 500 each, and these all make good illustrative material. They don't have to be pretty; we'll probably do them over to fit into the copy anyway. But they do have to illustrate something or in some way be significant.

Pictures? By all means. Nobody is going to look twice at a magazine article without any pictures. We all look at the pictures and read their captions before we read the article itself, as often as not reading the article only because we were attracted by the pictures. Considering the number of amateurs who are also camera enthusiasts, it is surprising how few pictures of amateurs in action during an emergency are received. Mostly what we get are newspaper clippings or photographs of non-amateurs.

Don't misunderstand. We appreciate what you send in, and do the best we can with it. But the concept of a National Emergency Coordinator with a constantly-packed suitcase by his desk, ready to hop the first plane for an emergency area and coordinate it at the same time he does a magazine-reporting job, is an obsolete and impractical one. Our work begins when yours is over. When the emergency is over and you have gathered the facts of what went on and have sent them in to us, then we have the job of seeing that they are adequately reported in QST. That word "adequately" is a key one. We cannot do an adequate chronicling job unless we have adequate material with which to work. It's up to you, our reporters in the field, to see that we get it.

Some time ago, in this column (Oct. 1955 QST) we suggested the designation of an assistant EC as "AREC reporter." This could be an important job for someone of your group who is handy with the pen and with paper work in general. We still think it is a good idea, but have heard of very few AREC groups doing it; usually it is the poor, harassed, overworked EC who not only does the promoting, organizing and routine reporting, but is expected to write up the results of emergencies and send them in to QST as well. No wonder so many of our reports are sketchy. How about some volunteers for this type of work from among you AREC members?

And you fellows with cameras: when you go out on an emergency call, throw your camera in the glove compart-

During the snowstorm in Nebraska, K8SCM was on the air continuously for 12 hours, during four of which he acted as control station. Les is only 13 years old and is in the eighth grade.

May 1960



ment, or hang it around your neck, and as time permits snap a picture or two of these amateurs in action. Can't tell a simple snapshot taken during the heat of an emergency may achieve immortality and bring you undying fame, as did the one on the cover of Nov. 1938 QST.

Kentucky SEC W4BAZ reports that amateurs participated in the explosion at Warsaw, Ky., on Dec. 26. W8HQK reported the incident in the Morning Kentucky Phone Net, saying that the Cincinnati Red Cross had dispatched a mobile unit to the scene and wanted a Louisville station to take traffic for that city. W4BAZ moved to the designated frequency of 3860 kc., contacted K8BRU/4 in Warsaw and succeeded in clearing some traffic despite low power at K8BRU/4 and the lack of c.w. availability.

On Jan. 10 a child was reported lost in the Warrington area just outside Pensacola, Fla. An alert was sent out on the ten meter net by W4EWG and within minutes the net was in full operation with about 15 mobile stations and several fixed stations participating. Net control station at search headquarters was K4IVD/mobile on 6 and 10 meters with emergency power in a well-equipped van. Both nets were in session for about 6 hours until the child was finally located and safely returned home.

When a series of mid-January snow and ice storms knocked out communications over a wide area in Nebraska, amateurs were on the job full time, including all Nebraska nets. The Morning Phone Net began operation at 0700 on Jan. 18, continuing until 1200 when the Noon Net took over and operated until 1815. At that time the Post Office Net started operation and continued until conditions forced an exodus to 160 meters. This around-the-clock operation continued for nearly three days, the nets handling hundreds of emergency messages for the Post Office Department, radio and TV stations, electric companies, telephone companies, state and county road departments, Nebraska schools and other organizations, and individuals. Net controls were W0s LFJ NHS ZOU HTA, K0s SVR DGW SPD SCM. Other stations handling traffic: K0s BDF HAZ KJQ QVM HKI BRS QQU OFM CDG LJW KUA OPC MYT RRL ULQ VPA MHR, K8WNTW, W0s DOU EXF LEF PDJ YFR EUT EFV VGH IAY NHB RSM ZWG BOQ DDT EGG FTQ HOP KDW KTZ LJO VZJ WGA WKP HQE ZJF. — W0HTA.

On Feb. 3 the western section of Nova Scotia was hit by a snow and ice storm which disrupted power, telephone and telegraph lines between Bridgewater and Yarmouth and Bridgewater and Middleton. An emergency net was established on 75 meters focussing around Liverpool, which received 30 inches of snow. VE1TN operated from his home station while power was on and from VE1US's mobile when power failed, handling traffic for the telephone company, the Canadian National Telegraph Company and the Nova Scotia Power Commission. Contact was maintained with Middleton, Bridgewater and Halifax throughout the emergency. Many amateurs from other parts of the province and adjoining provinces participated in the net. The u.h.f. civil defense net in Liverpool was in continuous use during the storm and the subsequent clean-up period. Stations participating: VE1s VN ABJ PA MA KE FQ DW NZ ABF LY GX AFU WL ADH IR QM BC ABB SE AFB MO LG FV AAR BJ, K9QET. — VE1US, EC Liverpool, N.S.

Fate and ham radio stepped in, on Feb. 19, to effect the rescue of the crew of a fishing craft run aground on a reef just outside Portland (Me.) harbor in a blinding snowstorm. Absolutely no means of communicating their plight to the mainland was available. By mere chance, however, the boat was spotted from the shore during a lull in the storm. The spotter happened to be K1HAX's mother, who told her son, and K1HAX went on the air with an emergency CQ on the frequency of the Cumberland County Emergency Phone Net. He was answered by K1BAY/mobile, who rushed to Coast Guard headquarters with the information. After several attempts in impossible conditions, the men were rescued, little the worse for the experience. However, since communications were down in the Portland area, they may have succumbed to the elements had it not been for the alertness of shore watchers and the prompt action of K1HAX and K1BAY. — K1LSJ.

Receiving word, on Feb. 5, that his sister-in-law in Charleston, S. C., was seriously ill, but having no means of communication, K8GOM contacted K8MMZ in Huntington, W. Va., who finally made contact with K4LNJ in Spartanburg, S. C. The latter accepted the traffic and, after some trouble, relayed it to W4VPN who tried to deliver by land line but, failing that, drove some 20 miles to reach the family for which the message was intended. Land line contact was then established. All this just to show that the ham spirit of helpfulness still exists. — K8GOM.

The Anne Arundel County AREC and RACES group assisted, on Dec. 13, with the movement of Baltimore's Sinai Hospital to a new location without breaking the continuity of hospital services. A hand-carried unit in the upstairs hall was used to notify a fixed station in the lobby that a case was on its way down. This station then notified a dispatcher on the street corner to dispatch an ambulance, designated by number, so that it would be waiting at the door when the case arrived. Progress of each ambulance was reported by two roving mobiles, by 13 mobiles stationed along the route and by fixed stations at both the old and new buildings. The Anne Arundel Radio Club had 35 amateurs handling the communications end of this vast and complicated movement, which went off like clockwork. W3NAE, county EC, was in charge.

On New Year's Eve the Hennepin County (Minn.) sheriff enlisted the aid of the Mobile Amateur Radio Corps, under EC K0CNB, in patrolling the highways in the Minneapolis-St. Paul area. Seventeen operators participated. Minor accidents spotted by roving patrols were reported to the control station and quickly checked out by the sheriff's office. There were no major accidents. Operation continued until 0300, Jan. 1.

Amateurs in Tioga County (N. Y.) assisted c.d. radio-logical teams in a simulated atomic bomb fallout exercise on Jan. 23rd. W2NVD did the groundwork in communications. Portable stations were set up at Owego and Waverly, two fixed stations at home locations were used as relays, and four mobiles took part. Eleven amateur operators were used.

We start off the new year with 31 SEC reports representing 10,820 AREC members. This is a substantial increase over last January in both categories. Sections reported: Ill., Vt., Santa Clara Valley, Maritime, N. Y. C. - L. I., Kans., Ore., Ga., Ala., N. Texas, San Joaquin Valley, E. Fla., S. Texas, E. Mass., Md.-Del.-D. C., Colo., E. Bay, S. Dak., E. Pa., Wyo., Nev., Me., Wash., Va., Mo., Ind., N. Mex., Mich., Okla., Kans., Ont.

In April QST we showed Indiana as having submitted eleven reports. The SEC indignantly claims he never missed a report, and the SCM has one in his file. Okay, we'll take the blame, and put Indiana on the 100% list for 1959.

RACES News

An extensive RACES network exists in Lake County, Indiana, called the Northwest Indiana RACES Net, under the management of W9EHZ. The net operates on 147.3 Mc. and is composed of 45 base stations



located at local broadcast stations, law enforcement offices, c.d. headquarters and hospitals in Hammond, Gary, Highland, Griffith and East Chicago. Two fully-equipped buses are available for immediate use. Ninety mobiles and base stations from Chicago area points participate in the network. On Dec. 18 the net was alerted on a standby basis

to assist local and state police in reporting traffic violations, accidents and other incidents. Out of 576 hours between Dec. 18 and Jan. 10 the net was in session 342 hours utilizing 58 mobiles, 30 base stations and 15 area support stations. Thirty-three emergency calls were reported during this time, and law enforcement officials were greatly appreciative and highly gratified at the assistance rendered. — W9EHZ

The Rock Island (Ill.) RACES group assisted in the evacuation of 100 families in the Rock River flood, Jan. 23 to Jan. 31, under the direction of RO W9RYU. The following amateurs provided communications: W0s BUE

IEY DGV, K9s HCW EUF ISK MVJ RTL SVH BES KZB. — K9KZB.

Two mobile and two fixed stations of Chautauqua County (N. Y.) RACES operated on 2 meters from 0300 to 0700 on Jan. 29 to handle traffic in connection with the train wreck at Westfield, N. Y. Taking part were W2RJH (RO), K2LVR and WA2ARB. — K2OQO.

On Feb. 8 the alternate Sector 1C headquarters located in Lexington, Mass., was activated for a Sector 1C RACES drill and test of equipment. The following local controls reported into the net: on 10 meters, Cambridge, Littleton and Bedford; on 6 meters, Arlington, Bedford, Carlisle, Concord, Lexington and Lincoln; on 2 meters, Cambridge, Concord, Lexington, Lincoln and Westford. Test results were evaluated and tabulated for future references and remedial measures. — W1SPL, RO Sector 1C, Area I.

On Jan. 31, New York C.D. Area 9 conducted an extensive RACES survey covering six counties in the general area of Rochester south to the Pennsylvania border. Purpose was to establish reliable circuits on optimum bands. Prior to the survey, studies were made of topographical maps and teams of mobiles were sent to strategic spots. Area radio officers were notified to be on the alert. Frequencies on 75, 10, 6 and 2 meters were used and tests conducted from 0745 until 1440. Six meters turned in the best performance, with ten and two meters doing all right from good locations, but 75 meters was generally poor. Skip conditions made things difficult on 10. Mobiles found that car directivity had much to do with successful operation. It also became evident that a good ground-plane antenna that can be carried by a car would be an asset, and that ability to read maps would help. Twenty-six operators participated in this survey from Monroe County under W2CTA and K2DZV.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made May 19 at 2130 Eastern Daylight Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted May 5 at 2100 PDST on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice

is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from March QST

- May 2: Build Your Own Receiver!, p. 19
- May 10: Notes on Parasitic Beams, p. 43
- May 13: The Geneva Radio Conference, p. 55
- May 17: Amateur V.L.F. Observation, p. 50
- May 24: A Poor Man's Q Multiplier, p. 46
- May 31: Speculations . . . Planet Civilizations, p. 71

W1AW SUMMER SCHEDULE

(Effective April 24, 1960)

(All times given are Eastern Daylight Saving Time)

Operating-Visiting Hours:

Monday through Friday: 1300-0100 (following day).

Saturday: 1900-0230 (Sunday). Sunday: 1500-2330.

Exception: W1AW will be closed from 2230 May 29 to 1300 May 31 in observance of Memorial Day.

A map showing how to get from main highways (or from Hq. office) to W1AW will be sent to amateurs advising their intention to visit the station.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules.

Frequencies (kc.):

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,900, 145,800.

Phone: 1820, 3945, 7255, 14,280*, 21,330, 29,000, 50,900, 145,800.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:

Sunday through Friday, 2000 by c.w., 2100 by phone.

Monday through Saturday, 2330 by phone, 2400 by c.w.

General Operation: Use the chart on this page for times and frequencies for W1AW general contact with any amateur. Note that since the schedule is organized in EDST, the operation between 0000 and 0100 each day will fall in the evening of the previous day in western time zones.

Code-Proficiency Program: Practice transmissions at 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and at 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday are made on the above-listed frequencies (except 1820 kc.). Code practice starts at 2130 each day. Approximately 10 minutes' practice is given at each speed. On May 19 and June 17, and on May 18, instead of the regular code practice, W1AW will transmit certificate qualifying runs and a frequency measuring test respectively.

* Single sideband.

W1AW GENERAL-CONTACT SCHEDULE

(In Effect April 24, 1960)

W1AW welcomes calls from any amateur station. Starting April 24, W1AW will listen for calls in accordance with the following time-frequency chart.

Time (EDST)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0000-0100 ¹	.....	.....	3555 ³	.....	3945	7080 ³	.....
1300-1400 ²	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1500-1600	.....	7080	14,100	7255	14,100	7080	.....
1600-1700	.....	14,280	7080	14,100	14,280	14,100	.....
1800-1900	.....	14,280	14,280	14,280	14,100	7255	.....
1900-1930	.....	7255	.....	21,075 ³	.....	14,280	.....
1930-2000	.....	14,100	.....	3555	.....	14,280	.....
2000-2030 ¹	14,280	3555 ³	14,100	14,100	7080 ³	14,100	.....
2030-2100	14,280	3555	14,100	14,100	7080	.....	.....
2100-2130 ¹	145.8 Mc.	21,330	145.8 Mc.	50.9 Mc.	21,330	.....	.....
2230-2300	.....	.....	1820	.....	1820	.....	.....
2300-2330	.....	.....	3555	.....	3945	.....	.....
2330-2400 ¹	.....	3945	7255	3945	7255	3945	.....

¹ Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 2000, on phone at 2100 and 2330.

² Operation will be on 21,075, 21,330, 28,080 or 29,000 kc., depending on band and other conditions.

³ W1AW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—The Eastern Pennsylvania Amateur Club station call is K3KPO. The club is now a League affiliate. HAU is pres.; AHX, vice-pres.; LOZ, secy.; HAS, treas. New club officers of the 807 Society are K3ELD, pres.; K3ANU, vice-pres.; K3DFK, secy.; K3BFW, treas. K3DZB made his first BPL. The Temple University ARC has started a Novice class. The club call is K3KJL. K3HXC has a new 10-meter beam with an Armstrong rotor. The Hilltop Transmitting Assn. will hold a "ham" auction May 7 at its Red Lion club house. The Lancaster Radio Transmitting Society will hold its Annual Banquet May 7. For reservations write to OY, DUI and ZLP are now RACES licensed. K3GYP is a new ORS. K3KFS, formerly of Detroit, has moved to Ambler. K3CEN received the "807" Society Award. HNK sends an invitation to join him on 160 meters. MKA, the club station of the West Philadelphia Radio Assn., has a new DX-100. DJW is attending Villanova University. K3-ANS has been accepted at Penn. State University. BUR, VR and CUL spent a winter vacation in Florida. NNL has a new jr. operator (No. 3). AMC erected a 10-meter antenna to meet skeds with his son BNR/6. BPZ is now a police officer in the city of Allentown. HB9FU was a Lancaster visitor and was greeted by a number of area operators. JNQ had to rebuild for the DX Test. DVB worked Arctic KL7 and Antarctic KC4 consecutively in the DX Test. Among the numerous antennas lost in the wind and snow storm was the beam of FKE, but plenty of DX was found on 40 meters. Other section representatives in the DX Contest were BEC, CMN, GYP and HZZ. The Cumberland Valley ARC held its Annual Banquet Mar. 27 at Chambersburg. The Carbon ARC held its annual banquet at Palmyra. FCC representatives were present to give General Class Exams. DUI, the SEC, has started a net (AREC EPA) on 3610 kc. nightly at 1800 EST. Its purpose is to keep in touch with the ECs and traffic. The Mahanoy Valley Brass Pounders Klub has started a net at 3708 kc. for any Schuylkill County traffic. ZRQ got lost on his trip to York. ZRI found him on 6 meters in a snow storm. Traffic: W3CUL 5195, IVS 1510, K3DZB 1079, W3VR 638, HNK 525, FAF 323, AXA 232, MFW 160, K3DCB 130, W3ZLP 122, K3EHP 103, W3FKE 78, J8X 72, K3HEX 66, W3ZQR 62, AMR 42, K3ANS 41, W3NNL 30, K3HHU 28, W3BUR 27, WHK 24, OY 10, K3GYP 18, W3ITI 16, K3CRU 12, W3JPB 8, AMC 6, K3CNY 4, W3DUI 4, ELI 4, K3HXC 4, W3BES 3, BNR 3, JNQ 3, K3ANU 2, BKL 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Delaware: P. R. DeCourcelle, 3DZQ. SEC: PKC. The MDD Traffic Net meets on 3650 kc. Mon. through Sat. at 1915; MEPN on 3620 kc. Mon., Wed. and Fri. at 1800 and Sat. and Sun. at 1800; MSN and MDD (slow-speed) on 3650 kc. at 1845 and 2030; WAT Net on 51.9 Mc. daily at 2030. All times are EST. New appointments: BPE as EC for Montgomery County, Md. Section Net certificates go to JWN, EKO and JZY. The Baltimore Polytechnic Radio Club's new officers are KN3-DRU, pres.; John Clauser, vice-pres.; KN3HRH, secy.; K3DAZ, treas. AHQ again leads the section in OO activity. BHK received a Public Service certificate at the Edison Award Dinner; Bill keeps a fully equipped emergency van ready to go at all times! BUD is working with CB equipment. CDG is a new reporter and is pleased with his Viking II. CDQ finds more operating time available now that the new rig has eliminated TVI. CPM has a new receiver. CQH was pleased to

work Ireland on 6 meters. K3CXX finds that school headaches overshadow traffic work. The Free State ARC now has a PE-95 10-kw. emergency power unit ready for emergency work and Field Day. NNM, HCE and ENU are now busy on RTTY. EEB still finds time after business hours for OO activity and MDD net work. EFZ is rebuilding a Navy GO-9 transmitter for contest work. EIS takes his OO duties seriously. K3EJF takes part in PG County c.d. drills. EKO is looking for more activity from Southern Delaware. EQK is rebuilding to 500 watts. Art reports that more Maryland mobilizers should apply for call sign license plates or the State may consider their discontinuance. FJF reports. FRZ is rebuilding the final for contest work. K3DCP has moved to a new QTH in Pikesville. K3GKF is looking for Nevada for 80-meter WAS. K3GZK keeps the MSN active. K3HPG likes his new OBS activity and wants more Bulletins. OO K3JTE received some very favorable newspaper publicity as a result of his successful QSO with M.I.T. via orbiting satellites. JWN makes BPL. JZY lost his antenna in the February storm. K3HTE keeps the B-CC High School station, K3KFM, going. KHA keeps up OBS activity in Baltimore. KLA divides his time between contest and OO duties. MSR lost his 2-meter antenna during the storm. OSF reports from Baltimore. OYX is starting Field Day plans for the Antietam Radio Assn. PQ keeps active in the MDD Net. RNY is rebuilding the final for DX work. TN again leads the section in MDD origins. UE continues his 3RN activity. K3WBJ keeps Walter Reed Hospital on the air. WV received ovations at the Edison Dinner and QCWA Banquet for having been active since 1906. ZAQ is busy with OO work. ZNW finds that EC and ORS activities take up his time. The WAYLAR meets the 3rd Sat of alternate months for area YLs and is now issuing a certificate for five QSOs. Traffic: W3UE 374, JWN 326, K3WBJ 130, W3TN 120, AHQ 70, EKO 65, BKE 44, BUD 42, ZNW 41, K3KFM 37, GZK 14, W3BEE 12, JZY 8, RNY 8, CDG 6, EFZ 4, OYX 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HWD and W2ZL. A N.J. Emerg. & Traffic Net certificate went to W2TLO, Glassboro. Net activities for the month were as follows: 29 sessions, 618 attendance and 90 traffic. W2ZL is the net manager. K2JGU, Glassboro, has received appointment as NCS on the AA2ORN/A Net. The Gloucester County Amateur Radio Club has been granted League affiliation. W2SXV, Hightstown, is NCS on EASN. Charlie also is heard on the Early Bird Transcon Net. W2BZJ has a new quad on 14 Mc. and is DX hunting. K2SNK, Trenton, also has a new Triband and a new receiver. K2CPR plans a European trip in April. His DX totals are now 252/248. W2BEI, Audubon, has skeds with KG1FR, K2KTS and K2DFE continue to do a fine job with the SJRA code and training class. W2HBE made 40 contacts in the recent V.H.F. Contest using a transistorized transceiver, 1-watt output. Ex-W2EGP is now W2FSN. W2BLV is using a 40-element 432 Mc. beam. K2SHJ, Grace, is recuperating from a recent operation. A fine news letter was received from the So. Counties Amateur Radio Assn. K2CIR, K2BWR and K2HBA, in the Atlantic Co. Area, are heard regularly on 160 meters. W2DDOU is c.d. RO for Somers Point. The SJRA made nearly a half million points in the recent V.H.F. Contest. Look for SJRA's QSO Party May 7 and 8 on all bands. The Levittown (N.J.) Amateur Radio Club meets the 1st Tue. Plans for incorporation and League affiliation are being considered by the club. Fourteen Form 1 reports were received but no reports from the Cape May, Mercer or Salem County Clubs. Traffic: (Feb.) K2DEI 277, W2RG 161, W2TLO 80, W2SXV 56, W2ZL 55, K2JGU 38, K2JJC 24, W2BEI 18, K2SOX 15, K2OWM 11, K2CPR 10, K2SNK 10, W2BZJ 8. (Jan.) W2BXJ 19.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—RMs: W2RUF and W2ZRC. PAMS: W2-PVI and W2LXE (v.h.f.). NYC CW meets on 3615 kc. at 1900. ESS on 3590 kc. at 1800. NYSPTEN on 3925 kc. at 1900. NYS C.L. on 3509.5 and 3993 kc. at 1800 Sun. TCPN 2nd call area on 3970 at 1900. JPN on 3880 kc. at 1900. W2PVI asks that we list the Erie County Emergency Net, which meets Sun. at 1230 on 3915 kc. Sixty or more stations check into this net. W2ACIG, K2SSX and W2EZB made BPL. The Radions of Lancaster became an

(Continued on page 116)

GRAND OLD OPRY

T WAS right after the Single Sideband Dinner at the Statler (during the IRE Convention) that I listened to "Grand Old Opry."

HE SCENE was our hospitality suite — a place where a fellow could get a dish of prunes or a mug of vichysoisse — but no scrambled eggs — like "Butch," KØDWC, wanted.

IN ONE corner was Wally Watts, W4VI/2, speaker of the evening, relaxing over a "T. O." Keyer. Working over another keyer was Fred, W4CF, and at still another was Ann, W2MWY.

STACKED behind them, and waiting their turn, were Mac, W2BIB; Willard, W3DQ; Roddy, W1SZ; Tim, W1KKP; Dave, W2JDR; "Profile" Dave, W2APF; and many others. Jack, W9GPI, was tuning the FPM-200 with his pool cue.

BUT what music! This was a small concert compared with the one run by Bil Harrison (W2AVA) downstairs, where hundreds of hams and hamesses could listen to the music and see the dots and dashes right there on the scope.

ENOUGH about CW. This was an SSB affair, and if anybody needed any convincing he'd know right away that here is a most efficient mode of communication. Our outstanding authority on this is the self-same "Butch," KØDWC, Lieutenant General Francis Griswold, Vice Commander of SAC, where they're performing communications miracles with SSB.

THE Single Sideband Dinner was a huge success with something like 900 people from all over the world. All of this was due to the splendid work of Ed Piller, W2KPQ; Bill Leonard, W2SKE; Dorothy and Irv Strauber, K2MGE and K2HEA; Irv Binger, W2CMM; Mort Kahn, W2KR; and many others.

SPEAKING of other parts of the world, I'll be in Italy around the middle of May and expect to be working from HV1CN and other stations, using all three modes — AM, SSB and CW.

SO UNTIL THEN . . .

SILENT KEY W9AIO

Amateur Radio on April first lost a real friend in the passing of Royai Higgins, W9AIO. We all will miss him.

— W9AC

73,
Bill Halligan, W9AC

Bill Halligan Jr. W. J. Halligan W9AC for hallicrafters



"RANGER" TRANSMITTER/EXCITER

This popular, superbly engineered transmitter also serves as an RF/audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier. Wide range pi-network coupling system will match antenna loads from 50 to 500 ohms—tunes out large amounts of reactance. Timed sequence keying. TVI suppressed. With tubes, less crystals.

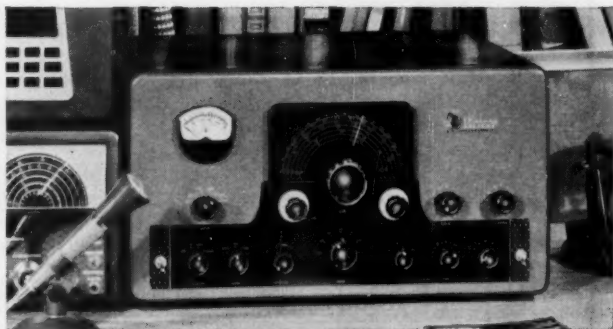
Cat. No.	Amateur Net
240-161-1...Kit.....	\$229.50
240-161-2...Wired and tested...	\$329.50

No matter what you expect from a transmitter...

"VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P. E. P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-104-1...Kit.....	\$349.50
240-104-2...Wired and tested...	\$439.50



"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt of power plus outstanding operating convenience! 600 watts CW input ... 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Built-in VFO or crystal control—VFO is temperature compensated, highly stable. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-1...Kit.....	\$749.50
240-500-2...Wired.....	\$949.50



The world at your finger tips!

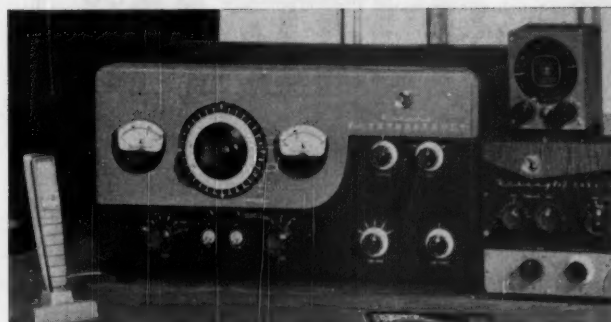
VIKING "KILOWATT" AMPLIFIER

This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input, and 1000 watt CW and plate modulated AM! Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. **Amateur Net**
240-1000... Wired and Tested. \$1595.00
251-101-1... Matching desk top, back and 3 drawer pedestal, FOB Corry, Pa... \$132.00

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

you'll get more with a **VIKING!**



"6N2" THUNDERBOLT POWER AMPLIFIER

Rated at a solid 1200 watts P.E.P.* input SSB and DSB, Class AB₁; 1000 watts CW input, Class C; and 700 watts input AM linear, Class AB₁—with continuous bandswitched coverage on 6 and 2 meters. Wide range pi network output—effectively TVI suppressed—outstanding efficiency! Drive requirements: 5 watts in Class AB₁ linear, or 6 watts Class C continuous wave. Completely self-contained. With tubes.

Cat. No. **Amateur Net**
240-362-1... Kit..... \$524.50
240-362-2... Wired..... \$89.50



"6N2" TRANSMITTER

A compact VHF transmitter with instant bandswitching coverage of both 6 and 2 meters. Power input: 150 watts CW; 100 watts AM phone. Completely shielded and TVI suppressed. External VFO or crystal control—may be used with Viking "Ranger," Viking I, "Valiant," or similar power supply-modulator combinations. With tubes, less crystals.

Cat. No. **Amateur Net**
240-201-1... Kit..... \$129.50
240-201-2... Wired..... 169.50

New Catalog

Your complete guide to amateur radio's most popular equipment. Includes details and schematics on all Johnson transmitters and amplifiers, as well as specifications on the complete line of station accessories, keys and practice sets, and antennas. Write for your free copy today!



COMING SOON... the new Johnson filter type sideband transmitter with 60 db sideband suppression!

FIRST CHOICE AMONG
THE NATION'S
AMATEURS



Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

FOR THE ACTIVE AMATEUR



Record keeping can often be tedious. But not with the *ARRL Log Book*. Fully ruled with legible headings it helps make compliance with FCC rules a pleasure. Per book **50¢**

Mobile and portable operational needs are met by the pocket-size log book, the *Minilog*. Designed for utmost convenience and ease **30¢**

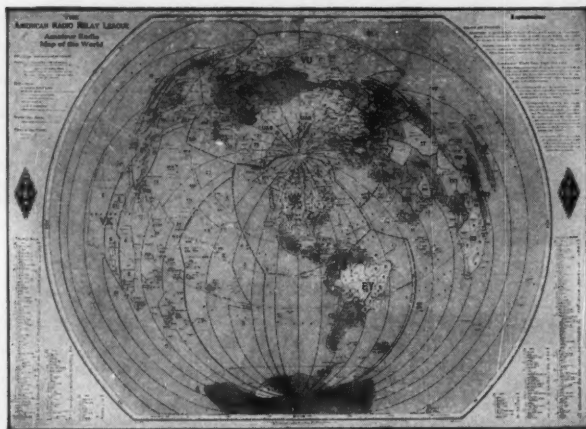
First impressions are important. Whether you handle ten or a hundred messages you want to present the addressee with a neat looking radiogram . . . and you can do this by using the *official radiogram form*. 70 blanks per pad. **35¢**

If you like to correspond with fellow hams you will find the *ARRL membership stationery* ideal. Adds that final touch to your letter. Per 100 sheets **\$1.00**

Strictly Modern!

• Old maps are quaint but ARRL does not compete with ancient cartographers . . . we leave that market to the antique shops. Our World Map is strictly modern.

No active amateur can afford to be without one of these popular and useful adjuncts to good operating. Here is why the ARRL World Map is such a favorite:



As soon as you hear a DX station you can see exactly where he is—the country prefixes are not just listed in the marginal index; they're printed on the countries, themselves. You can tell his direction from you, and his distance. There's no question about which continent he's in—boundaries of the six continents are plainly marked.

The time zones are plainly marked, too. Call areas of thirteen countries are shown. Principal cities are designated. There's a scale of miles, another of kilometers. Printed on heavy map paper measuring 40" wide x 30" high, in 8 colors that really stand out, this new ARRL World Map is easily read from your operating position.

40" x 30" 8-Color Map, \$2.00, postpaid anywhere in the world

AMERICAN RADIO RELAY LEAGUE, INC.

38 LA SALLE ROAD

WEST HARTFORD 7, CONN.

FROM HEATH ... 9 NEW RADIO AMATEUR KITS



HD-20
\$14.95

100 KC CRYSTAL CALIBRATOR KIT (HD-20)

Align or check calibration of your communications gear with this versatile ham aid. Provides marker frequencies every 100 kc between 100 kc and 54 mc. Transistor circuit is battery powered for complete portability. Accuracy is assured by .005% crystal furnished. Measures only 2½" x 4½" x 2¾". 1 lb.



GC-1
\$109.95
\$11.00 dn.,
\$10.00 mo.

TEN-TRANSISTOR 'MOHICAN' GENERAL COVERAGE RECEIVER KIT (GC-1)

An excellent portable or fixed station receiver! Many firsts in receiver design for outstanding performance . . . ten transistor circuit . . . flashlight battery power supply . . . ceramic IF transfilters. The amazing, miniature transfilters used in the GC-1 replace transformer, inductive and capacitive elements used in conventional circuits; offer superior time and temperature stability, never need alignment and provide excellent selectivity. Other features include telescoping 54" whip antenna, flywheel tuning, tuning meter, large slide-rule dial and attractive, rugged steel case in gray and gray-green. Covers 550 kc to 30 mc in five bands. Electrical bandspread on five additional bands cover amateur frequencies from 80 through 10 meters. Operates up to 400 hours on 8 standard size "C" batteries. Sensitivity: is 10 uv, broadcast band; 2 uv, amateur bands for 10 db signal to noise ratio. Selectivity: 3 kc wide at 6 db down. Measures only 6½" x 12" x 10". 20 lbs.

Heathkit XP-2: plug-in power supply for 110 VAC operation of GC-1. (optional extra). 2 lbs. **\$9.95**

7 more kits on following pages

HEATHKIT® . . . WORLD'S FINEST HAM GEAR



KL-1
\$399⁹⁵

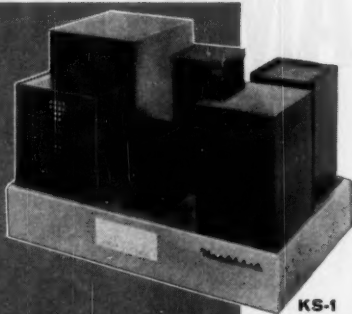
\$40.00 dn.
(Write for time
payment details)

"CHIPPEWA" KILOWATT LINEAR AMPLIFIER KIT (KL-1)

Here is a top-quality kilowatt rig with all the features you've been looking for. Operates at maximum legal power input on all bands between 80 and 10 meters, in SSB, CW or AM linear operation. Premium tubes (4-400A's), forced air cooled with centrifugal blower. Grid neutralized, continuous plate current monitoring, extensive TVI shielding. Features both tuned and swamped grid circuits to accommodate all popular exciters. Operates class AB1 for SSB and AM linear service and high efficiency class C for CW service. Convenient panel controls include power switch, tune-operate switch, HV on/off switch, final bandswitch, meter switch, grid bandswitch, grid tuning, mode switch, plate tuning, plate loading and bias adjust. Accessory connectors are provided on the rear apron of the chassis for complete compatibility with all control circuitry in the Heathkit "Apache" Transmitter. Two meters provided; one monitors final plate current; the other indicates switch selected readings of final grid current, screen current, and plate voltages. Send for complete specifications now. 70 lbs.

A PERFECT COMPANION FOR THE "CHIPPEWA" KILOWATT POWER SUPPLY KIT (KS-1)

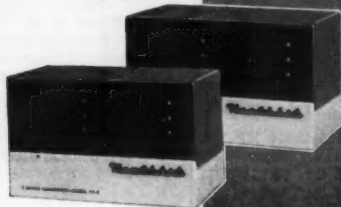
Ruggedly constructed for heavy-duty use in medium to high power installations, the KS-1 fills the requirements of a top-notch power supply with economy and safety. Features an oil-filled hermetically sealed plate transformer, "potted" swinging choke input filter and 60-second time delay relay. Line filters minimize RF radiation. Maximum DC power output is 1500 watts. Nominal voltage output, 3000 or 1500 volts. DC current output, average 500 ma, maximum 1000 ma. Control circuitry is arranged to allow remote installation. The KS-1 employs two 866A half-wave mercury vapor rectifiers in a full-wave, single-phase configuration. Power requirements: 115 V, 50/60 cycles, 20 amperes; 230 V, 50/60 cycles, 10 amperes. 105 lbs.



KS-1
\$169⁹⁵

\$17.00 dn.,
\$15.00 mo.

XC-6
\$26⁹⁵



XC-2
\$36⁹⁵

6-METER CONVERTER KIT (XC-6)

Extends frequency coverage of the Heathkit "Mohawk" and most other general coverage receivers into the 6 meter band. Converts 50-54 mc signals to 22-26 mc. 3-tube circuit provides two RF stages and low-noise triode mixer. Calibration accuracy assured by .005% overtone crystal supplied. Provision for external RF gain control. 6 lbs.

2-METER CONVERTER KIT (XC-2)

This top-quality 2-meter converter may be used with receivers tuning any 4 mc segment between the frequencies of 22 and 35 mc when appropriate crystal is used. Converts 144-148 mc signals to 22-26 mc with .005% overtone crystal supplied. High quality parts used throughout. Silver plated chassis and shields. 7 lbs.

IN KIT FORM TOPS IN TRANSMITTING POWER

TWO BRAND NEW MODELS HEATHKIT 10 & 6 METER TRANSCEIVER KITS

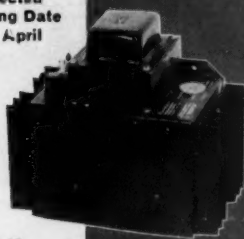
Complete ham facilities at low cost! The new Heathkit transceivers are combination transmitters designed for crystal control and variable tuned receivers operating on the 6 and 10 meter amateur bands (50 to 54 mc HW-29 and 28 to 29.7 mc for HW-19) in either fixed or mobile installations. Highly sensitive superregenerative receivers pull in signals as low as 1 microvolt; low power output is more than adequate for "local" net operation. Other features include: built-in RF trap on 10 meter version to minimize TVI; adjustable link coupling on 6 meter version; built-in amplifier metering jack and "press-to-talk" switch with "transmit" and "hold" positions. Can be used in ham shack or as compact mobile rigs. Not for Citizen's Band use. Microphone and two power cables included. Handsomely styled in mocha and beige. Less crystal. 10 lbs.

VIBRATOR POWER SUPPLIES: VP-1-6 (6 volt), VP-1-12 (12 volt). 4 lbs. Kit; \$8.75 each, wired; \$12.95 each.



**HW-19 (10 meter)
HW-29 (6 meter)**
\$39.95 each

Expected
Shipping Date
late April



HP-10
\$44.95

NEW! IMPROVED DESIGN TRANSISTOR MOBILE POWER SUPPLY (HP-10)

Brand new power supply for mobile gear; features all-transistor circuit, instant starting, high efficiency, rugged construction. Operates from 11 to 15 VDC input; at 12 VDC, provides 600 VDC @ 200 ma, or 600 VDC @ 150 ma & 300 VDC @ 100 ma simultaneously, at 120 watts. Negative 150 volts @ 30 ma also provided. Max. ambient temp., 150 @ 120 watts ICAS. Input current requirements: 2 amps, idling; 13 amps, full output. Includes heavy filtering of input and output leads, remote relay control of primary power, silicon rectifiers, and extruded aluminum heat sinks for efficient cooling of power transistors. Measures 8" x 7 1/2" x 6 1/8". 10 lbs.

ORDER DIRECT BY MAIL OR SEE YOUR HEATHKIT DEALER*

*The convenience of Local Heathkit Sales and Service costs but a few dollars more.

HEATH COMPANY

a subsidiary of
DAYSTROM, INCORPORATED

Benton Harbor 8, Michigan

All prices and specifications subject to change without notice. Please include postage on orders to be shipped parcel post. 20% deposit is required on all C.O.D. orders. All prices are NET F.O.B. Benton Harbor, Mich., and apply to Continental U.S. and Possessions only. Dealer and export prices slightly higher.



FREE CATALOG!

Describes over 150 easy-to-build electronic kits in HI-FI, Test, Marine, and Ham radio fields. To get yours, fill in this coupon and mail today!

ITEM	MODEL	PRICE

NAME

ADDRESS

CITY ZONE STATE

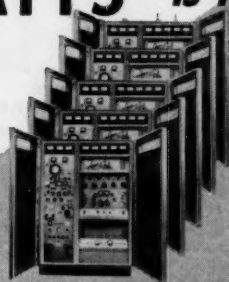
TMC's 10,000 WATTS *IS NOW*

GPT-10K

Over 100 in use

BULLETIN
207

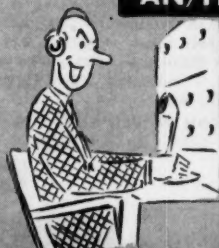
in commercial and military installations throughout the world have made this transmitter one of the best known in its field.



AN/FRT-39

Thousands of Hours...

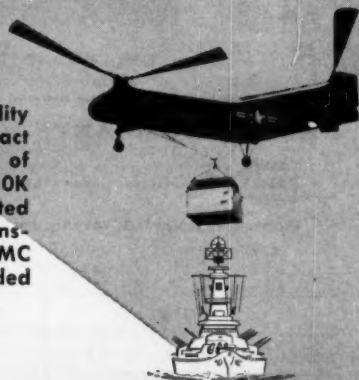
...of continuous operation under all conditions have proven its ability to give long term, trouble free, stable communication over the frequency range of 4 to 28 megacycles on ...



SSB · ISB · DSB · CW · AM · FSK

**MOBILE,
SHIPBOARD and
FIXED**

applications have tested its ability to take a beating. This rugged, compact transmitter can take it and like it. Ease of tuning and maintenance make the GPT-10K ideal for any installation. This field tested and thoroughly proven 10,000 watt transmitter is now used as a driver for the TMC Model GPT-40K (AN/FRT-40) where added power is required.



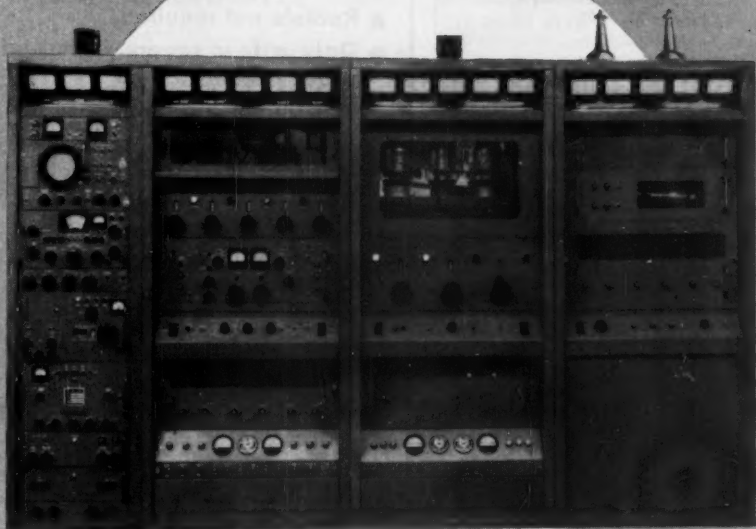
The TECHNICAL MATERIEL CORPORATION

**USED
TO
PUSH**

40,000 WATTS

GPT-40K

AN/FRT-40



BULLETIN 206

The GPT-40K a completely self contained transmitter, including all power supplies and ventilating equipment is, as shown above, housed in four modular assemblies occupying only 40 square feet of floor space.

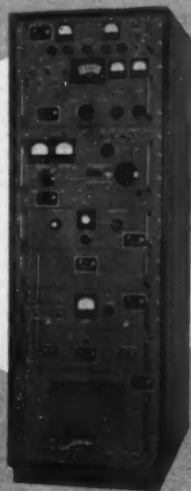
4-28 mc CCS, 40,000 watts PEP, 20,000 FSK-CW.

1 part in 10^8 per day stability, 320,000 channels, available with SBG-1 (AN/URA-30)

SINGLE SIDEBAND GENERATOR SBG-1

AN/URA-30

BULLETIN 226



MAMARONECK, NEW YORK

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6IJ	VK9AT
CO2W0	KL7BUZ	VK8CJ
CN28K	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EI4N	KZ5CS	VP6TR
F8VQ	LA3SG	VP7NM
F88ZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	VS1HC
G3DOG	OK1FF	VS2DW
GC8DO	ON4AY	VS6LN
GI3WUI	KG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PA8FAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY8NE	ZE1JV
HP1LO	SM5AQ8	ZK1BS
II1MV	SP6BY	KH6MG/ZK1
JA1ANG	TI2LA	ZK2AD
JZ0HA	UA1AU	ZL1ABZ
W1AW	UA8KB	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8DJ	ZS1OU



FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. **ONLY \$16.95.**

73
GOTHAM

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	<input type="checkbox"/>	\$29.95
10-15 TWO BANDER.....	<input type="checkbox"/>	34.95
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95
----------------------------------	---------	-----------------------------------	---------

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95
---	------	--------------------------------	-------

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

FREE! FREE! FREE!

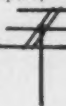
Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered, element information, size of elements, boom lengths, power and decibel gain figures, weight, feed line used, polarization, and other valuable information. Send card today!

CITIZENS BAND ANTENNAS • Any of our ten meter beams or the V40 vertical is perfect for the CB operator.

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<input type="checkbox"/> Beam #R6 (6 Meters, 4-El)...	\$38.95
<input type="checkbox"/> Beam #R10 (10 Meters, 4-El)...	40.95
<input type="checkbox"/> Beam #R15 (15 Meters, 3-El)...	49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

<input type="checkbox"/> Std. 2-El Gamma match	19.95	<input type="checkbox"/> T match	22.95
<input type="checkbox"/> Deluxe 2-El Gamma match	29.95	<input type="checkbox"/> T match	32.95
<input type="checkbox"/> Std. 3-El Gamma match	26.95	<input type="checkbox"/> T match	29.95
<input type="checkbox"/> Deluxe 3-El Gamma match	36.95	<input type="checkbox"/> T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

<input type="checkbox"/> Std. 2-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 2-El Gamma match	31.95	<input type="checkbox"/> T match	34.95
<input type="checkbox"/> Std. 3-El Gamma match	34.95	<input type="checkbox"/> T match	37.95
<input type="checkbox"/> Deluxe 3-El Gamma match	46.95	<input type="checkbox"/> T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

☐ **V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15.....\$14.95**

☐ **V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS...\$16.95**

☐ **V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO.....\$18.95**

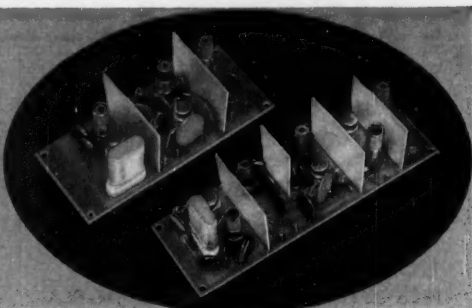
HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

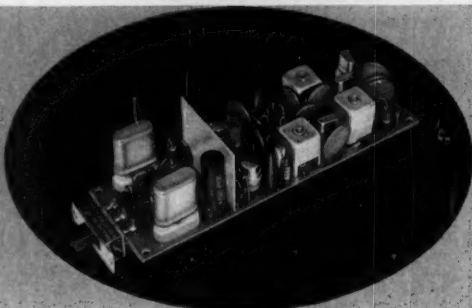
Address.....

City.....Zone.....State.....

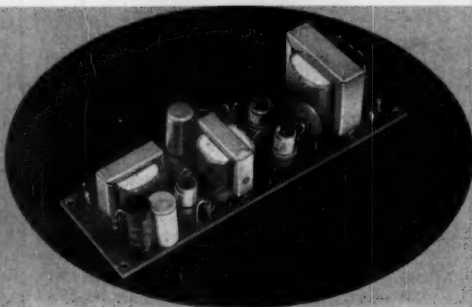
● **CONVERTERS (TRC-1)** Three transistors, crystal controlled, pretuned. 10 meters or Citizens Band. RF amp., mixer/osc. Double tuned front end. IF output 6 MC. Other IF on special order. Power: 15 VDC @ 5 ma. Wired and tested with crystal.....\$17.95 (TRC-2) Two transistors, double tuned front end. Crystal controlled. Standard IF, BC band. Other IF on special order. For 75, 40, 20, 15, 10 meters and Citizens. Power: 6-12 VDC @ 4 ma. Wired and tested with crystal...\$10.50



● **MIXER IF UNIT (TRB-1)** Six transistors, 2 diodes. 6 MC mixer. Crystal controlled local oscillator. 455 KC IF. Highly effective noise limiter and squelch. Combine with Converter and Audio Units makes dual conversion superhetrodyne receiver. Input: 6 MC standard. Specify frequency. Wired and tested with 2 crystals.....\$32.50



● **AUDIO UNIT (TRA-2)** Three transistors. Input: 100,000 ohms and 50 ohms. Speech amp. for dynamic microphone. Push-pull power amp. 500 ohm output for modulation. 3.2 ohm output for speaker. 300 milliwatts output. Idle current 10 ma. Peak current 80 ma @ 15 VDC. Wired and tested.....\$21.50



● now for the first time a complete

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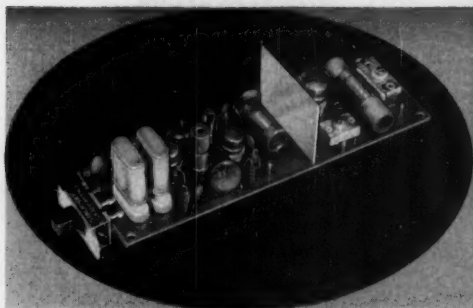
- AMATEUR ● 27 MC CITIZENS BAND
● Converters ● Mixer IF ● Audio Unit
● Transmitters ● Oscillators

This outstanding lineup of transistor sub-assemblies offer "exciting" new compact receiver and transmitter construction. Designed and built to International's finest standards,

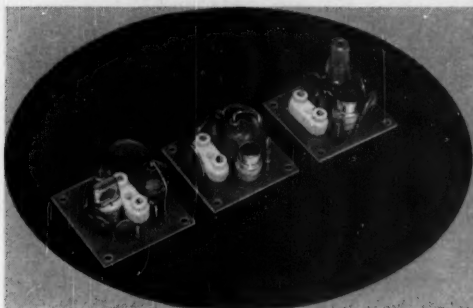
these printed circuit units may be used separately or combined to build extremely portable transmitters and receivers for the Amateur and Citizens bands.

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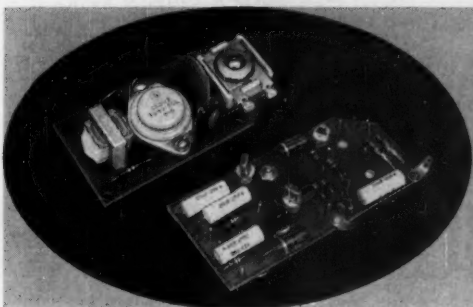
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- **TRANSMITTER UNIT (TRT-2)** Three transistors. Crystal controlled. Switch for two freq. Output: 100 milliwatts on 10 meters or Citizens band. Power stage uses special HF transistors. TRA-2 Unit for modulation.
 Wired & tested less crystals and transistors.....\$10.00
 #1 Transistor Kit (100 milliwatts output).....\$17.50
 #2 Transistor Kit (50 milliwatts output).....\$ 8.00
 Crystals type FCB for Citizens band (.0025%).....\$4.75 each
 Crystals type FA-5 for Amateur (.01%).....\$4.00 each



- **OSCILLATORS (TRO-1) (TRO-2) (TRO-3)** Three separate transistor units with total of 8 frequency ranges (100 KC to 60 MC). Average output varies over frequency range. Average 1 volt across 2200 ohms. Power: 9 VDC @ 3 ma. ● (TRO-1) Low freq. 100-300 KC and 200-5000 KC. ● (TRO-2) Medium freq. 3000-20,000 KC. ● (TRO-3) Overtone. 15 MC — 60 MC in 5 ranges. Specify freq. range. Use type FA-5 or F-605 crystals. Wired and tested less crystal.....\$4.00



- **POWER AUDIO OSCILLATOR (TRO-10)** For calibration purposes. Delivers 2 volts across 50 ohms. Frequency 1000 cycles or 2000 cycles. Specify when ordering. Power: 6 VDC @ 100 ma. Wired and tested.....\$14.50
- **AUDIO FREQUENCY COUNTER AMPLIFIER (TRA-30)** Frequency 200 cycles to 30 KC. When used with 100 microampere meter makes sensitive frequency counter. Input for saturation: .001 volts rms. Counter amplifier only, less meter, wired and tested.....\$32.50

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See the new International all transistor **Traveler 27 MC Transceiver** at your International dealer or write for complete details. **15 transistors** . . . built-in speaker . . . separate phone jack . . . mounting bracket for mobile use. **COMPLETE**, with portable nickel cadmium battery and built-in charger, microphone, 2 sets crystals, whip antenna, carrying strap, mobile mounting bracket...only **\$249.50**



ALSO AVAILABLE:
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 Model, wood case, 2
 sets crystals, micro-
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SOME BRIEF FACTS ABOUT THE HAMMARLUND

HX-500 SSB TRANSMITTER

- A 100-watt SSB transmitter for amateur and commercial use on the 3.5, 7, 14, 21 and 28 to 30 MCS bands.
- Separate dial scale for each band, or portion of 10 λ band.
- All crystal included for all amateur bands — nothing extra to buy.
- Frequency readability to 200 cps, or better.
- Stability after warm-up better than 100 cps.
- Provides choice of upper, lower, double sideband, CW, FM, FSK for RTTY plus 40 cycle identification keyed shift.
- ALC adjustable to prevent overdrive.
- 50 ohm fixed pi output.
- Built-in antenna changeover with receiver antenna input connection.
- Adjustable RF level controls output power when employed with high power linear.
- Carrier suppression 50 db or better.
- Unwanted sideband suppression 50 db or better.
- 3rd and 5th order distortion products down 30 db or better.
- Spurious frequencies down 50 db or better.
- T.V.I. suppressed.
- VOX and anti-VOX controls conveniently located on front panel.
- Key and mike input provided on front panel.
- RF level meter range 60 db with adjustable sensitivity control.
- Self-balancing diode balanced modulator.
- Overall audio response 300 to 2300 cps.
- Shaped CW keying.
- FM-FSK center frequency adjustment on front panel.
- 60 kcs filter type SSB generator.
- Provision for metering final plate current.
- Unitized construction.

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HAMMARLUND MANUFACTURING CO., INC.
Since 1910 460 W. 34th ST. N.Y. 1, N.Y.

Station Activities

(Continued from page 102)

ARRL affiliate recently. Appointments: WMTA-ORS, K2BYD-ORS, WA2JZK-ORS, K2JNF-ORS. Endorsements: K2SSX, K2KTK, W2BLO and K2KNV as ORSs, K2LGI and K2KNV as OOs. K2HWI reports the Red Cross Net for NYS meets on 3875 kc. at 1200 on the 1st Sun. of each month. W2KCR is NCS. W2RUF is recovering from a serious illness. W2EQM married our K2JBX. They now reside in Clyde. WA2EOZ reports the ARATs had a visit from ILYCZ, who is an exchange student from Trieste. The North Chautauqua ARC will hold its annual banquet Apr. 30. Better get your reservations in now for the Western N.Y. Hamfest sponsored by RARA to be held at Doud Post May 14. The Ogdensburg ARC got off to a flying start on Charter Nite Mar. 10. W2BB was the main speaker. W2FKK is pres. and the club sponsors Novice and Advanced classes 6 hours per week and every member either attends or teaches. All members are working on WAS. K2RFC reports that more than 150 hams and XYLs attended the dinner and social sponsored by the combined Broome County Area clubs on Feb. 27. W2BKC reports that the Utica Red Cross Chapter has provided funds for a complete station and emergency power supply. The station is licensed with the call WA2KMG. Credit goes to all area hams organized as the Amateur Emergency Communications Assn. of Utica. The RAWNY is inviting area clubs to affiliate. The clubs would get the benefit of a large organization for administration and program, yet have a change to remain autonomous. K2QDT has a new Apache and an HQ-170. K2QPC and WA2DAC report 220-Mc. activity in their respective areas. W2TST is on the air with an FB homebrew d.s.b. rig. K2UJZ received WNH and Empire State achievement awards. W2EUP is building a transistorized mobile rig with all except the r.f. stages, a.m. and a.s.b. 80 through 10 meters. The N. Syracuse HS ARC has a club station, a DX-100, a Super-Pro and the new call WA2JXN, reports K2SSX. Traffic: (Feb.) WA2CIG 1102, K2SSX 771, W2EZB 595, K2AQO 250, W2OE 227, K2RTN 189, W2IYP 132, WA2CRH 116, K2UJZ 113, K2QDT 109, K2RYH 92, W2TPV 78, W2FEB 68, W2ZRC 66, W2MTA 65, K2MES 59, W2BKC 56, K2JBX 48, K2IMK 46, K2MPE 34, K2GWN 31, W2RQF 30, K2RWV 30, K2JXF 29, K2EQB 28, K2TDG 26, K2MIY 22, K2OQO 21, W2CQY 18, K2BBJ 16, WA2FML 15, W2BLO 14, W2KTK 14, W2PVI 11, W2PGA 9, W2QKQ 9, WA2EOL 7, WA2DAC 4, K2HUK 4, (Jan.) W2RUF 170, K2OQO 6, (Dec.) WA2JZK 27.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RM: GEG, NUG and KUN. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The PFN meets Mon. through Fri. at 1800 EST on 3850 kc. New appointees are ROA as OBS and MFB as ORS. K3HWL received his General Class license. K3KJG is a new ham around Butler. CA is going RTTY. BVZ has a new HT-37. Congratulations to KUN on his fourth consecutive month of making BPL. The Horseshoe RC reports via *Hamateur News*: Our Division Director, YA, was guest at the March meeting; UNQ and ROA got themselves new SX-101As; KQD received his DUF-2; MBB lost his beam; K3ELL and UNQ have new beams. WXZ is advisor for the Butler ARC. New General Class licensees around Johnstown are K3HHB and K3IYU. 4QDY paid WRC WRE a visit. The Etms RC reports via *Oscillator*: RAP appeared on WTAE recently; K3HZL passed the General Class exam; QPJ is back on the air; the Breeze Shooters Hamfest will be held on May 22 at the Lodge in North Park; K3CYM is active on 6 meters. OEZ is home after a lengthy stay in the hospital. Third Region (3RN) harmony was at its highest in January with WPA taking over the top spot for the first time of many a year. This could not have been accomplished without the faithful services of KUN, K3GHH, LXQ, YUL, K3CLX, GEG/8 and ZEG. Traffic: W3KUN 603, UHN 73, WRE 70, K3GHH 66, W3SIJ 26, NQ 16, K3HWL 15, COT 5, W3MFB 2.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME—SEC: PSP, RM: USR, PAM: RYU, EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. USR has been appointed as the new RM for this section because of the resignation of PCQ, who has taken on additional duties which will curtail his operating time. Many thanks for the sympathy cards received on the recent death of my father. LCG received his WAS. The Mississippi Valley Radio Club elected FXW and KOPH as its new officers. K9HVB, the Lake Forest Boy's Academy

(Continued on page 118)



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*...you get the best of all
in the all-new*

HAMMARLUND HX-500 SSB TRANSMITTER

The result of two solid years of engineering and development by the best communications engineers in the business — and now ready for your evaluation. It's the all-new HX-500 SSB transmitter, loaded with advanced design features and performance.

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station, is being reactivated by K9RHU, K9UP and K9VMW are the two newest hams in the Quincy Area. UYP has completed his linear and is now a full-fledged s.s.b.-er. K9OWF and K9QNG have joined the ranks of General Class. K9VIG reports that the traffic count for the No Name Net for January was 195 messages in 26 sessions and the February total was 156 messages in 24 sessions. The ILN handled 333 pieces of traffic in 19 sessions and K9QYW, net manager of the North Central Phone Net, reports a traffic count of 206. RYU has been appointed EC of Rock Island and Mercer County. K9QJP is using a new D-104. TZN has remodeled his shack and now claims greater DX. SXL, the EC of McLean County, has added Chenoa and Cookville to his C.D. Net, on 6 meters with Gonset Communicators. K9IDW has been appointed Asst. EC for McDonough County by the EC, K9BIV. GDI lost his quad during the recent ice storms. K9HWC has been working on 220 Mc. during the skips and reports conditions are surprising. The Midwest V.H.F. Club is sponsoring monthly hidden transmitter hunts. K9TXP is on 6 meters with a new Globe Scout and a three-element beam. GSK is putting out an FB monthly paper for the Illinois MARS Net. GZK was killed in a train accident Feb. 11. He will be missed by the Chicago Area gang. VWJ finally has gone s.s.b. and hopes to hear from the boys who left him alone in the a.m. frequencies. K9AMD is getting quite the author's, having had three articles published. The Eastern Division Convention will be held in Indianapolis, Ind. Sat. and Sun., Sept. 10 and 11. Make plans now to attend and get up a gang so that the Illinois section will be well represented. Traffic: W9DO 846, IDA 600, MAK 582, IMN 512, K9AIR 408, W9USR 397, QQG 289, K9IVG 252, PLF 224, W9FAW 141, SXL 105, K9OAG 32, W9TZN 90, K9UGV 68, W9XV 64, K9RAS 25, LXC 31, BIV 19, QYV 19, KMH 15, W9RNL 14, K9MOK 11, W9VNZ 9, K9DEW 8, OCU 5, JBK 4, LMY 4, QPJ 4, W9JZN 3, K9LRS 3, W9SKR 3, WPC 2, NIU 1.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SQT. PAMs BKJ, MEK, RVM and UKX. RMs: DGA, JOZ, TT and VAY. Net sked: IFN, 0800 daily and 1730 M-F on 3010 kc.; ISN, 1730 daily on 3920 kc.; QIN, 1900 daily and RFN, 0700 Sun. on 3650 kc.; QIN (training), 1800 M-W-F on 3745 kc. New appointments: RVM as PAM for IFN, OZJ as EC for Fayette County. New OBs are K9DGO on 75-meter s.s.b. and GEL on 6 meters. ILK a new OPB and AHD, KCQ and TFJ are now OEs. Officers of the Lew Wallace (high school) Club are K9NTZT, K9NQXS and K9PFQ. We report with regret that NZZ, who has made BPL 108 consecutive times (9 years), must curtail his activity because of illness. Stan can be reached at the Irene Byron Hospital in Ft. Wayne. K9NVBX is running 50 watts with a Knight-kit; the receiver is an SX-100. The Lake County Amateur Radio Club held a successful banquet with 350 in attendance. K9OXA, OO, gave cooperative checks of frequency modulation, etc., to eight stations in February. Fifty people spent a very enjoyable evening at the North Eastern Indiana RC's Annual Banquet. The Hoosier Lakes RC elected ENU, K9FFT, K9ISD and JMI to serve as officers. K9IBT is now General Class. LYU is editor of the new bulletin of the Tippecanoe ARC. Newly-elected officers of the Michiana ARC are WCE, RZO, PDF, K9AJC, K9PNL, BDG, K9UOJ and ZIB. WJY is trustee of AB. K9BSL is handling traffic via RTTY. LZJ is on 6 meters with a Heathkit 6er. IJF finally snagged Delaware for WAS. MNA, K9LJW and SHT are working 6-meter portable from hospitals. *Parasite* is the new club bulletin of the Michiana V.H.F. Club. Editors are ZPF and K9VH. *Amateur radio exists as a hobby because of the service it renders.* Feb. net reports: RVM reports IFN with a total of 513; VAY reports QIN's traffic total at 602; JOZ reports 63 for the QIN Training Net; 399 for the ISN was reported by MEK. DGA, GJS, JOZ, NZZ, MM, ZYK and TT made BPL Traffic: (Feb.) W9MM 1266, JOZ 831, TT 74, ZYK 691, NZZ 600, GJS 467, VAY 238, DGA 237, SWD 127, BKJ 100, K9UTZ 106, W9WID 91, K9ORZ 58, W9RTH 70, EH2 67, BDG 64, MEK 50, K9AOM 58, W9RVM 58, DOK 54, K9IXD 52, W9EJW 50, MJJ 49, CLY 45, SNQ 42, K9LBD 41, AYI 37, BSU 37, K9NTCG 31, K9QJR 30, GSV 25, W9OCC 25, YJI 25, YXX 24, K9PTS 23, W9DZC 19, K9MAN 19, W9FWH 16, NIT 16, BDP 15, EGV 15, CC 14, K9ILK 12, OXA 12, AUE 11, IJF 11, W9HUF 10, QYQ 10, IMU 8, BVR 7, K9LZJ 7, LAQ 6, W9HRW 4, NTR 4. (Jan.) W9VNV 9, UXI 1.

WISCONSIN—SCM, George Wolda, W9KQB—SEC:

YQH. PAMs: NRP, GFL and K9IQO. RMs: SAA and K9ELT. BEN certificates have been issued to K9ECH and K9OSC. NPX, with four states confirmed on 2 meters, is now OES. RQM stabilized his v.l.o. while on K9PQT received his WAS and WAC certificates. RM K9ELT became a DXCC member. The Manitowish County V.H.F. Net meets Wed. at 1930 on 145.198 Mc. The Four Lakes Amateur Radio Club of Madison elected ZZW, pres.; K9KVA, vice-pres.; K9HQZ, secy.; K9MAW, treas. Meetings are held the 1st and 3rd Tue. in the Red Cross Bldg. From the LaCrosse Club: There is a new Collins S-Line at VRI, a new HT-37 at K9BVM. FAA is on 15 meters with a new quad. K9CPE has 91 countries confirmed on 15-meter s.s.b., GGY is breaking in a new TA-33, JHL passed the 200 countries confirmed and GPU is the proud owner of a new HQ-180. Instruction classes in theory are conducted by ZSO: code by K9HFL. KXK, of Waupaca, worked all ARRL sections in the last SS and K9LWV logged 500 SS contacts. QIX is holding nightly schedules with K9IBH on 14 Mc. taking their c.w. traffic. YT, at the U. of Wis., now is with MARS. The antenna farm at K9UJ consists of three dipoles, a vertical and two long wires. News from Eau Claire: The club has a new monthly bulletin, *Splatter*, K9TNU editor; K9QHP now is General Class; the net frequency of 29,620 kc. is monitored daily. New club officers include K9SFM, pres.; K9LSV vice-pres.; BEW, secy.; and ASQ, treas. The Green Bay Mike & Key Club enjoyed its 9th Annual Banquet and sent news of MAI's new homemade vertical, a new beam at K9CZC and an NC-101X at K9OCO. RACES activity is high in Green County with 14 stations licensed. Bad weather caused the attendance at the first meeting of the Wis. Council of Radio Clubs to be small. Plan to attend the next meeting at the Wausau Hamfest on May 21. Traffic: W9DYG 1148, K9GYQ 509, W9CXY 205, SAA 111, K9B 97, CBE 77, NRP 55, K9DOL 39, W9LFL 36, K9SGC 24, DTK 22, W9VVC 22, VHP 21, WJH 21, K9ORR 14, W9MWQ 11, CCO 9, SZ 7, K9IQO 6, W9IXA 4, K9JQA 4, W9OVO 3, RQM 3, K9LCA 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W9HVA—PAM: K9KJR. RM: KTZ. K9OSV reports that he has made WAC, making his final contact during the DX Contest with VQ2MS. BHT is now on 2 meters and has had a daily schedule with HVA. POW has a KWS-1. DO reports that the 160-Meter Goose River Net, which has been meeting for more than 10 years each Sun., meets at 9 a.m. on 1980 kc. The average number of check-ins runs from 22 to 35. This net covers the eastern part of the State. The North Dakota C.W. Net reports for February: 13 sessions, 80 check-ins, 15 pieces of traffic. The North Dakota 75-Meter Phone Net reports for January: 25 sessions, lowest number of check-ins 20, highest 47; traffic handled, 73 formal, 53 informal and 11 relays. K9ADI 112, MHD 96, TYV 70, ITP 63, GGI 37, GRM 37, RMS 28, W9NJJ 22, K9EHT 22, PWH 19, TVM 19, EJE 15, W9YCL 15, IAN 6, GGH, K9KRV 5, IAB 4, W9PHC 4, WIQ 4, OMA 3, K9RRZ 3, W9IHM 2, K9RRW 2, TNI 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, W6RRN—SEC: SCT. Ex-MPQ has returned to Sioux Falls after several years in Youngstown, Ohio, as 8IKE. The Radio Research Club is newly organized in Brookings with K9YAA as pres.; Dean Tillinghause, secy.; and K9AYW, treas. The Huron ARC elected K9DPD, pres.; SDK, vice-pres.; ILL, secy.-treas.; RDX, net mgr.; K9TKO, NGM and TKX, assistants. ZWL reports the highest participation in the Weather Net since its inception five years ago. K9VYY has a new SX-111. K9TMM has installed a Mosley beam on a 55-ft. tower. New calls in Sioux Falls are K9BYWP and K9BYVC. TBI is now located in Hannibal, Mo. Traffic: W9ZWL 336, UAJ 317, BMQ 303, DYB 136, K9AIE 32, W9DLY 43, K9LX 32, VYV 29, W9OPF 25, CTZ 22, K9KLR 21, W9BMP 17, LKH 16, K9SEJ 14, DUR 12, FCR, W9JSE 10, K9DYR 6, QMM 6, QPK 6, DHA 5, VQC 5, ACJ 4, APZ 2, W9NAE 2, K9RQY 2, W9RRN 2, T2T 2, YVF 2.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W9KJZ—Asst. SCM: Rollin O. Hall, 0LST. SEC: TUS. PAMs: K9EPT, OPX and TUS. RMs: RIQ and K9IZD. The LRARC, Fergus Falls, elected LUJ, pres.; K9WXL, vice-pres.; and K9YDT, secy.-treas. K9WVY cleaned his rig of harmonics with the help of K9MGT and LBC. BGY built a new rig, 200 watts to a single 814. UMX visited KYG and SNG. EC MNY has a BC-610F 500 rig on the air. PSF is building a 6-meter mobile rig. WOM is experimenting with f.m. gear for 6-meter use. Two new YLs are K9YJR and TVU. It's good to have PST and KFN home from the hospital. Illinois is gaining our FB EC, OLB, who will work

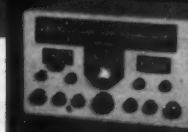
(Continued on page 120)

A CLASSIC—THE RME 6900



...SETS NEW
SS RECORD

1369 QSL's atop the record-breaking log sheets of W9IOP



The final test of any receiver is more than a screen room check. It's made on the operating table of ham shacks everywhere under tough, realistic band conditions.

If everyone has done his job right . . . and this means operating features as well as electrical characteristics . . . the new receiver is on its way to success. And occasionally with zeal and understanding uncommon except among people who love their work, a product is produced that so far outshines anything comparable in cost that it becomes a classic. We are confident the new RME 6900 will earn this reputation.

Here is a report on serial No. 1, delivered to W9IOP . . . one of the RME executives—three hours before the 1959 ARRL Sweepstakes. In the 40 hours of operating time permitted, 1,369 contacts in all sections were worked . . . a new all-time national SS record was on the books. The RME 6900 meets all of its electrical specifications but what's important and cannot be merely put into words is the enormous flexibility and the great operating ease which makes it possible for an operator, even an inexperienced one, to take a new receiver and handle it as he would an "old friend."

Yes, the RME 6900 is a classic receiver . . . the perfect joining of skill in the laboratory with certain knowledge of what operators require. We repeat our statement. Whether you operate CW, single sideband or AM, you will have the almost uncanny feeling the 6900 was designed solely for you.

- **CONTROLS:** 11 1/2" Single Slide Rule Tuning Dial; Logging Scale.
- **COVERAGE:** 80, 40, 20, 15 and 10 on 5 bands plus 10 to 11 mc for WWV or WWVH.
- **Peak Selectivity** plus tunable "T" Notch.
- **Internal 100 kc Hermetically Sealed Crystal Calibrator.**
- **500-ohm and 4-ohm Outputs.**
- **Noise Limiter** for SSB and CW, AM.
- **Separate Detector** for Single Sideband.
- **S Meter** Calibrated in 10 db Steps Above S9 for

- Better Reading.**
- **Improved Fast Attack AVC Circuit.**
- **Selectable Sideband.**
- **Panel of Attractive Grey "Clad-Rex" Vinyl Bonded to Aluminum with Charcoal Trim.**
- **Front Panel Controls Re-Grouped** for Ultimate Operating Ease and Convenience.
- **SENSITIVITY:** 1 mv. 30% Modulation for 100 mw output.
- **S-N-R:** 10 db at 1 mv Input.
- **SELECTIVITY:** 500 cps, 6 db down, in CW mode.

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6th EDITION

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for the Milwaukee R.R. as electronics engineer. K6CIW purchased a Globe Champ 300-A. Public School Principal DYC runs a 140-watt homebrew rig with an RK47 in the final. PAM OPX and RM RIQ are remodeling their farm home. K6LNE is back from W5-land. OO WMA's report listed one violation, and LST's listed fifteen violations. BNA is CAP Chaplain for the Little Falls Squadron. Low-power enthusiasts CRO and K8-LJV are enjoying contacts with their one-watt rigs. CRO has contacted both coasts and K4-Land on 10 meters. BWN's son presented him with a second grandson. Dir. BUO attended the Mankato Club meeting. TCK is assembling an electronic organ from a kit. PET returned from his Manitoba trip. KLY installed the Gonet Twins in his car. K8ALL received the WBE certificate. HUU devised an i.f. amplifier for his Collins receiver. OGP is assembling an Apache kit. K6HJC is studying engineering at the U. of M. Tech. Class RNV has his General Class license. IRJ joined the MARC. K6ICC earned the Washington Loggers certificate. K6VCC is an industrial arts instructor and new EC for Koochiching County. Renewed as OPSs: OET, TWG, IDV, EPT, HEN, and OJG. Renewed as OES: K6DOU. The following ECs had their certificates endorsed: TKR, GH, VBY, GQQ, HPN, KFN, KYK, MAH and MEQ. Endorsed as ORS: RIQ and KJZ. Endorsed as OO: LST. WAS has applied for OO appointment. Traffic: W0TUS 532, KJZ 264, K6SNG 178, SCS 150, EWC 157, W0RIQ 135, KYG 131, KLG 120, ISJ 97, UMX 91, K6QEK 89, QVF 88, IZD 83, W0JOK 83, KFN 81, LST 77, TWG 70, K6EPT 63, W0JG 61, K6B1 58, W0HEN 55, K6IKU 52, LWK 48, W0BUO 46, K6IDY 45, W0N3N 40, OPX 43, K6MAB 41, W0PET 40, K6YJ 39, W0ROJ 35, K6QLM 33, UXT T31, W0WMA 31, FGP 30, NYM 30, W0YHR 19, ALW 18, K6RGP 17, W0DYC 15, K6KYK 15, MGT 14, PML 14, W0BGY 12, RA 12, K6MNY 11, W0ET 11, WVT 11, ECR 7, K6WYV 7, W0UYR 4. (Jan.) K6EWC 56. (Dec.) K6EWC 110.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR, PAM: DYL, RM: K3TYW. WEE, EC of Boone County, reports that they now have AREC fully organized and equipped for almost any communications emergency that might arise. We would be most happy to see more of the counties follow this fine example. YHT now has a 20-A on the air (barefoot). K3TYW has a new rig on and is running 100 watts on s.b. and c.w. K5TKJ is the proud holder of a new Tech. Class ticket. We know how happy Ed is with it. ACU has been ill for the past several months. We sure do miss Herman. IXC has been revamping his RTTY converter. K5KQD has new beam atop a new tower. The Dixie V.H.F. Net met recently and voted to change the name to Ark. V.H.F. Club and Net. K5GOW reports that four new towns are reporting into the V.H.F. Net from Texarkana, Helena, Forrest City and Success. Three new members were added to the club—ZVF, K5TNK and K5WTY. Traffic: W5RYM 31, DYL 9, SMN 6, K3TYW 5.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—CD certificates are coming in at a steady pace for renewing. Traffic reports show an increase, applications for ORS and OPS are coming in more often and general interest is up. 4LDM/3, who recently moved to Shreveport and who has been 3FTH, KP4ZW, DLATJ, KG1EM and 6PWZ, is active on TXN, RN5 and UTL. His XYL is W4KZT/5. Newly-licensed hams include K5UKK, K5UKJ and KN5VBC. A new OO recently signed up is K5SBF. SKW has been appointed EC for the Lake Charles Area. The Ouachita ARC Hamfest will be held at the West Monroe Fairgrounds Sun. May 1. MXQ has been temporarily off the air because of transmitter trouble. FYZ has renewed his OES appointment and is active on 144 Mc. with 13 states confirmed. Route Mgr. CEZ, who is on LAN 1900 CST 3615 kc, RN5 1945 and 2130 CST 3645 kc, CAN 2030 CST 3670 kc, and UTL 1900 and 2215 CST 7093 kc, is always on the lookout for c.w. traffic men. If you are interested in handling traffic on c.w., look him up on one of the listed nets. New officers of the Lafayette ARC include K5KRG, pres. AOV, vice-pres. K5VJT, sec'y, K5SGX, treas. K5OPH. EC, Shreveport, has a new mobile club. Officers are K5RKH, pres., JMN, sec'y, K5WKZ, treas. JMN recently acquired a new DX-100. K5LKC and K5SBF got their antennas up at Oil City. KGM, recently of New Orleans, has been transferred to Dallas. Al was active on s.b. first with a homebrew rig and lately with 8-Line equipment. K5AGJ has been reappointed ORS and OPS. USN is in the process of being moved to new quarters on the lake front in New Orleans. In the meantime temporary station facilities have been set up in the Naval Reserve facility (Continued on page 122)

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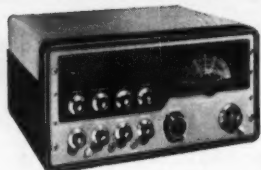
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adjoining the new radio station. ARRL OB schedules are transmitted by W5C8N regularly. Traffic: (Feb.) W5CEZ 462, MXQ 279, K5AGJ 41, L4C 16, W4MBO 10. (Jan.) W4LDM 3 164.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—K5HYD has returned to Tupelo and is on the air with a kw. AMZ is planning to return to the air on s.s.b. The first C.W. DX Contest showed fine activity in Mississippi. CKY reports 173 countries have been worked. The recent ice storm caused much havoc in the northern part of the section. The fellows did an FB job providing emergency communications. Am on my way to Memphis to meet with the Delta Director and other SCMs of the division. K5IIN reports his contest score was 306. Now that you have my address let me hear from you, gang. K5HYO reports the following: The boys at the U. of Miss. recently formed a club. Officers are FNM, pres.; K5SHB, vice-pres.; DRP, secy.; K4QZD, treas. The Cleveland ARC will hold its annual hamfest June 5 at Indianola. UXJ is back on the air after burning out a power transformer in his receiver. GRV has a new Hammarlund SP-600. The GAFB MARS Net has changed the Wed. night meeting to Sun. afternoon at 1900. Officers of the Cleveland ARC are to meet with the Cleveland Chamber of Commerce as they are concerned about a tornado alert system for this area. K5TXZ still is in the hospital at Lackland AFB. LWQ has a new HRO-60 receiver. K5HYO hopes to have a new four-element Thunderbird Tribander beam up at this QTH soon. Traffic: K5IIN 24, W5JHS 17.

TENNESSEE—SCM, R. W. Ingraham, W4U10—SEC: K4EJN.. RM: FX, PAMs: PAH and UOT. HBZ was presented with the Boy Scout Silver Beaver Award. K4FNR worked EL4A on 80-meter c.w. K4EDB reports QNI average of 15 in 21 sessions of the Oak Ridge Emergency Net. WBK says the Memphis transmitter hunts are held each two weeks. K4OKK is on a.s.b. with an 80-10 and RRV says he is heading for a.s.b. New receivers: RRV an HQ-170C; PEP an HQ-190. IFN has his 210 DXCC sticker and is going to try 2 and 6 meters. New appointments: K4KTC as OO and OES. EC renewals: TZG and K4EDB. Thanks for reports: OO, TZG and K4RIN; OES, K4KYL; net, PAH. New calls heard on the C.W. Net are FCU, VNE, WJH, YGL, K4s FNR and PLC. Thanks to those who made Tennessee 100 per cent QNI in 4RN and NCS 4RN each Sat. Traffic: (Feb.) W4PL 324, OGG 204, FX 172, CXV 166, EIN 162, VJ 126, PQP 110, NHT 71, UVP 68, K4FNR 52, OUK 46, AMC 38, W4FPF 34, UIO 31, FCU 20, UVL 20, IFN 14, JVM 11, PAH 11, K4EDB 10, LPW 10, W4TZG 10, K4MUQ 8, W4DFR 5, K4RSU 4, ZQZ/4 4, KYL 1. (Jan.) W4FPF 23, VNU 5, VTS 3.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst., SCM: W. C. Alcock, 4CDA. SEC: BAZ, RM: K4CSH, PAMs: SZB and K4HCK V.H.F. PAM: K4LOA. The Kentucky Novice Net (KNN) is operating daily on 3720 kc. at 1630 CST. KN4GOV asks for more QNIs from Kentucky. This net is a valuable training aid and supplies KYN with some top operators. K4LOA now has a 6-meter c.w. net in full swing. Technicians increase their code speed for the General Class examination. K4LSB and others operated 8VVL in directing mobiles for pledge pick-ups in a telethon. New on KYN are K4JF and K4JGV. K4LSB soon will be on with Model 15 teletype. JUF is active on 6 meters again. K4DFZ has a new BC-696 for a stand-by rig. SZL is running 600 watts to a new GG linear. K4DFO and K4ZQR are new OO appointees. ADH is working on a new 6-meter rig with a pair of 100THs. DMV is on 6 meters from Shepherdsville. RHZ reports he is sold on electronic keying for a perfect fist. KN4FXN was active in the Novice Roundup. KJP has a perfect attendance record on MKPN for the past four months. OO reports were received from SZL and K4BUB. BUB hasn't missed an OO report for two years. Carl is truly an amateur in the public interest. Traffic: K4CSH 281, W4BAZ 242, RHZ 124, K4WBG 121, W4SUD 105, K4AVX 102, DFO 96, W4CDA 75, K4CC 53, HCK 37, KWQ 37, QCN 35, W4KKG 28, K4HOE 26, SBZ 22, W4SZB 21, K4DFZ 16, FRY 15, W4SZL 14, HTD 13, K4QHZ 13, VDO 12, W4SYE 11, NUQ 10, ELG 7, ADH 6, K4PUM 6, W4KJP 5, UHV 5, K4ZQR 5, W4JUI 4, K4SPJ 4, MPV 3, KN4FXN 2, K4LSB 2, KIS 1.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN, RM: ECW, OCC, FQ, Q, PAMs: AQA, NOH (v.h.f.). K8LKA and RHD are new ECs. K8BZL, K8CKD and TIC are new OPs. OO EMD turned in 280 violations, 153 Novice, 249 2nd harmonic. The Wolverine S.B. Net welcomes s.s.b., a.m. and c.w., daily, 1900 to 2000, 3930 kc. The Saginaw Valley ARA

(Continued on page 124)



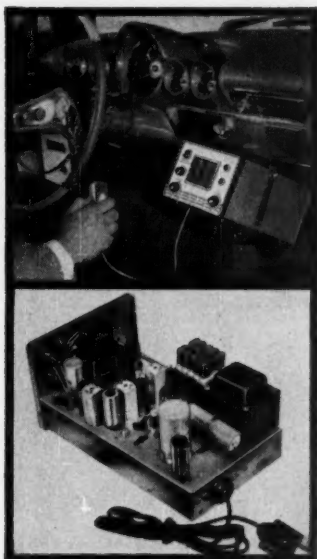
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Pre-tuned for 29.4 to 29.7 mcs.—covers any 5 frequencies within a 300 kc segment of the 10-meter band. Compact and lightweight—exceptionally easy to install anywhere. 5½" high, 7" wide, and 11¾" deep. For 6 V D.C. and 115 volts A.C., 12 V D.C. and 115 volts A.C., or 115 volts A.C. only. Dual voltage units will operate on D.C. voltage with just the switch of a power cord (furnished with the unit). Complete with power cords, tubes, microphone, and crystals for one frequency covering 29,640 kc, national calling and emergency frequency. Up to 4 additional crystal pairs may be installed for other frequencies of your choice for routine operation.

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12BE6 . . . Mixer—Crystal Oscillator	12AB5 . . . Modulator
6BJ6 . . . I.F. Amplifier	7054 . . . Crystal Oscillator
6AL5 . . . Detector, AVC, ANL	7061 . . . Power Amplifier
12AU7 . . . First Audio and Speech Amplifier	12BW4 . . . Rectifier

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furnished communications, mobile, for the Saginaw Mothers March on Polio. Seventeen operators were involved. The Red Cross in St. Clair County called a surprise alert. In 30 minutes 14 AREC hams were on the job, with EC QFQ in charge. Genesee Co. RC has the club station ACW going with nets on 80, 75, 10 and 2 meters. Ice pulled down all 6 towers and antennas on EMD's antenna farm. The St. Clair Valley ARC's new officers are K8BDJ, pres.; K8IEK, vice-pres.; K8NOZE, secy.-treas.; VE3DFU, rec. secy. Metro (Detroit Area) Ham News refers to "Eyeball QSO" as lid talk. How true! ELR, Oakland Co. EC, comes out with a swell AREC bulletin. QBO has 100 volts and a linear amplifier set up in a house trailer. QXK gets Colt 22-TVI elimination? QIC has a new NC-300. K8KOO gets the State Police "Ham of the Month" award. BFF and K8BGZ report only local contacts on 6 and 2 meters. SWF relayed a message from Santiago to Pittsburgh for a new drug, which was received in time. FDO reports an RME-69 and an ART-13 were donated to the Straits ARC by K8JNB. K8SLL learns traffic-handling in the Indiana/Michigan Novice Net. K8EWI got a 35-w.p.m. sticker. HKT lost his mast in a sleet storm. JYJ is handling Antarctic traffic and has had 123 contacts so far. FSZ has a new Viking Navigator. K8KCO has a new NC-300. The Muskegon RC officers are KTJ, pres.; FDE, vice-pres.; K8CCJ, secy.; K8NSAF, treas.; K8KPS, act. The Holland ARC has appointed K8PVP as communications manager. EMD says c.w. has increased on 6 and 2 meters in the Kalamazoo Area. Reports that GOV has a 3894 anal. K8Z and K8JZL have 4X250B finals and CVQ is on 220 Mc. TOX has a No. 15 teletype. The Albion ARC's officers are LIW, pres.; K8NPWP, vice-pres.; ALK, secy. K8QDM, 15 years old, of Grand Rapids, recently received his General Class license. Grand Rapids Catholic Central High School has a new station with an Apache and a Mohawk. Traffic: (Feb.) W8PWF 620, OCC 857, NOH 24, FWQ 218, OTJ 152, W8JXX 104, FX 86, K8EXE 74, KMQ 74, W8YAN 71, ELW 70, ILP 60, RTN 51, K8JUG 49, GJD 48, NAW 48, W8JYJ 34, K8BZL 32, W8SWF 29, QOQ 28, ATB 23, AUD 20, TBP 19, K8LPV 18, W8ACW 17, FDO 16, EU 13, K8SLL 12, W8ZHB 11, K8SEW 10, W8DSE 8, ALG 7, FSZ 7, QIX 7, WVL 5, EGI 4, WXO 4, K8HLR 3, W8HKT 2, K8IXA 2, KCO 1. (Jan.) W8JXK 77, HKT 30, IBB 27, K8CWI 24, W8JYJ 14, K8JUG 9, CKD 5.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: DAE and VTP. PAMS: HZJ, WYS and K8HGD. Among us Ohio amateurs, there is one outstanding member, Walter Ermer, AEU. He won the Edison Radio Award, sponsored by General Electric Company for 1959, by his untiring efforts in organizing and directing the Cuyahoga County branch of Amateur Radio Emergency Corps. We are all mighty proud of you, Walter. Henry County ARC's 1960 officers are UPL, pres.; FGN, vice-pres.; QCL, secy.; SMW, public relations; PKD and FGN, publicity. The club meets the 3rd and 4th of each month. K5UFW, ex-EPW, joined Silent Keys. K8NRXD, a new amateur in North Canton. NP, K8EJN and HZN have new Mosley Triband beams. The Massillon ARC's 1960 officers are NP, pres.; NEB, vice-pres.; K8EJN, secy.; FSM, act. mgr.; and K8EKG pub. mgr. The Seneca RC heard recorded tapes from the Dayton Hamvention V.H.F. Forum and is holding code classes. K8KPY is on 2 meters with a Seneca. KLD is in the hospital. VYU is back Stateside after a cruise in the Navy. Coshocton County ARA's 1960 officers are K8NSE, pres.; K8BEN, vice-pres.; and K8NYN, secy.-treas. The club's 6-meter mobiles helped pick up March of Dimes contributions. K8NYN has a new Globe Champion. K8KBF has a new NC-300 and K8GSK is mobile. K8BXT sent this news: K8ECW and K8SPVN have new DX-40s, K8AZY has a new HQ-170. FBE is attending Tri-State College. K8HQN is operating portable in Arizona, NCW moved to Lebanon and has a new G66. K8CMG moved to Dayton. RQL and K8LCX have new Tri-band beams. K8LSI has a new Mohawk. KCE is the new Radio Officer of Trumbull County C.D. PPH is on 10-meter s.s.b. K8SPEQ has a new S-85 and an Adventurer. K8PGZ has a new HT-32A and an HT-35. RZK has a new HT-37. PKC has a new 100A and the Warren ARA's 1960 officers are K8NCV, pres.; K8LDX, vice-pres.; K8KOP, secy.-treas.; K8KHS, corr. secy.; KFE, act. mgr.; K8GAS trustee. IKE moved out of the State. K8SRT is a new ham in Piqua. Toledo's Ham Shark Gossip names OFG as its "Ham of the Month". K8s RHD and RZL are new hams. HWX was in the hospital, as was K8HSJ. Columbus ARA's Carascope tells us that Mr. Sam Oppenheimer spoke to the members on Transistors and Their Operation in Practical Circuits, the club's code and theory classes have been started. K8DGI is engineer at WMNI, K8RTA is mobile on 6 meters now. K8OGY has a new Seneca VHF-1. WRH, K8LZB, NCV, NQN, OAS, OUD, PDF and PFG have their General Class

(Continued on page 128)

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Where space is a factor and only 12 volt power is available, this Webster Electric Power Converter provides exceptional performance from an unusually compact unit (2" high x 2" deep x 4½" long — weighs only 12 oz.). Ideally suited for receivers and low-powered transmitters in mobile equipment. It converts 12 volts into 250 volts DC — features automatic overload protection; mounts in any position. There are no moving parts to wear out or lose adjustment. Regulation exceeds that of mechanical converting equipment.

COMPONENTS DIVISION

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126

licenses. Springfield ARC's Q-5 states that the new boys ended the phone boys in a bowling match. Jack Port, an ex-W8, gave a talk with demonstrations on "R/C Transistor Techniques" and the Field Day committee has been picked. The Rag Chewer is published by the Lancaster-Fairfield ARC, an up-and-coming club with code and theory classes, pot luck dinners and 42 members.

It will be a family picnic type at the Fairgrounds. IBX received DRD, WBCN and SMCRA Awards. Don't forget May 7 is the date for the Dayton Hamvention. New appointees are LOE, 4FAN/8 and KRRFY as OESs. The Clermont Sun, printed in Batavia, carried two articles publicizing amateur radio. KN8PKY has an S-40B/QC-1 receiver and AT rig with 43 states. KGWKG has WWVA, WISL, WBZP, WJZZ and WBSK offers advertising space, pres.: Bob Johnson, vice-pres., John Brobst, treas. Adrian Fallert, rec. secy.; and Walt Schneider, corp. secy. Traffic: (Feb.) WSUPH 1875, DAE 767, ZYU 397, BZX 253, K8ONQ 120, GWK 106, W8QLJ 92, KD8HJ 78, W8CXW 116, KR8PF 68, W8AL 45, LZS 35, KM8HO 32, W8OUO 42, K8MSQ 26, W8XYG 24, DG 20, WE 15, W8VLA 14, LCR 13, KM8XY 12, MYG 8, HSB 7, Jand 7, W8MIA 6, W8TMM 5, W8GSO 2, BBZ 2, Jand 2. Jan./KGWKG 55, WD8DG 20, K8NCJ 6, MYG 4, W8RO 3, LZS 2. (Dec.) W8BXZ 261, ZYU 111, DDQ 54.

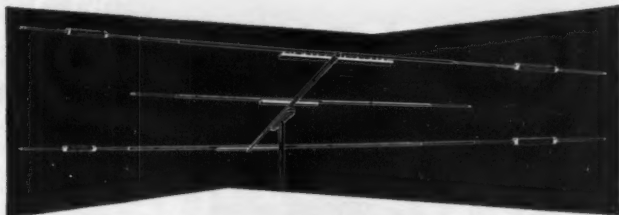
HUDSON DIVISION

EASTERN NEW YORK—SCM. George W. Tracy, W2FV—SEC. W2GKC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc at 1900; NYSPTEN on 3925 kc, at 1800; SRPN on 2690 kc, at 1600; ESS on 3590 kc, at 1800; ENY (emerg.) on 29.490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. Appointment: K2LZW as ORS. Endorsement: K2MUM as ORS. IICF spoke on antennas and traps, 36 meeting. AIBS: K2VJL. K2VJL is leaving for 6 months to duty with the National Guard. Thirty-two states on 6 meters are reported by K2BGU. It's nice to have W2VP back on the air. His many friends will miss K2KUU, a Silent Key in Feb. K2IOM represented the Yonkers Club at the East Coast V.H.F. Hamfest, S.A.b. on 40 meters with a 500-watt Courier in the activity at W2UE. The money prize was won by K2ZNY. K2ZNY is a ham who has been very successful in demonstrated his mobile gear. K2YRZ writes an interesting column for ESS-ZED *Newsletter* for the R.P.L. Club (W2SZ). The Schenectady AREC operates two nets on 75 and 6 meters each Sun., at 1400. Those graduates of classes sponsored by the Communications Club of New Rochelle include W2VJA, J2C, J2D, J2E, J2H and J2I. Congrats to all. K2ZDD, W2AGXQ, K2JBHC and K2JG are the first three to have been awarded a trophy hunt in Armonk. New Rochelle reports 35 card-holding members in RACES with weekly drills. The Hudson Amateur Radio Council represents 23 clubs in the division with plans to include all. If your club is not included, write to the president, W2TUK, for full particulars. Congrats to our two BPL winners, K2UTV and K2BIC. Challenge: (Feb.) K2UTV 3330, K2VJ2 1025, K2-BIG 184, K2OZT 119, K2YUW 107, W2ATW 101, K2YIG 221Kc, K2ZBK 60, K2YXB 40, K2ZWD 40, K2BIO 37, W2FUE 25, K2HNW 19, K2YTD 17, W2GTC 13, K2BGU 2, (Jan.) K2MRU 114.

NEW YORK CITY AND LONG ISLAND—SCM.
 Harry J. Dannels, W7TUK—SEC. W2ADO, RM. W2VDT, PAM. W2UGF, V.H.F. PAM. W2WEW. Section nets: NLI 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net: 144, Me. Tue., Wed., Thurs. at 2000 EST. K2VCH is the "hot" traffic handling net with its third BPL, which earns him a medalion. Congratulations. Vic. W2VDT earns another BPL card on originations plus deliveries. W2GPG and his 80-meter QRP rig snagged a KS4 in a big pile-up. K2KXT and K2VCO have both won Regents Scholarships and hope to attend college in the fall. W2GPG and K2VCH made the news headlines with their recent communications with elite ionized vapor trails. Congratulations, Ray and Perry! For information to all, here is a listing of our section's county ECs: Manhattan, K2JVB, Bronx, W2DUP; Richmond, W2VKF; Kings, K2CTK; Queens, W2LKG; Nassau, W2FI and Suffolk, W2KNA. Please contact these local representatives for ARRL information in your area. W2VCH is now using a VLF converter to receive the SX-101A and a converted 522 transmitter. Antenna problems at the new QTH are plaguing K2YQK, who is trying to load a ten-foot-high 40-meter doublet on 3630 kc. W2OTA attempted balloon bounce work with the Wallops Island tests. Results were negative, but Mike and I will be back in the fall. W2VCH is now running a Commuter II and an eight-element beam on 2 m.

(Continued on page 128)

WHAT'S NEW?



THE BIG SIGNAL BEAM FOR 20 & 40 METERS
BUILT FOR OPERATION AT MAXIMUM LEGAL AMATEUR POWER
EXCLUSIVE DESIGN AND CONSTRUCTION FEATURES
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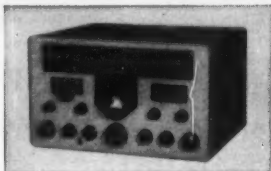
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see page 119

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ters. K2PTS has been having fun on 160 meters—states hunting. K2UYG received the R-6-K award. W2BWT is on 6 meters with a TBS-50D and an HQ-110. The Patchogue Senior High School ARC, W2EBV, is on the air with a National R-115 receiver and TBX and TDZ surplus rigs. An s.w.r. bridge at W2UAL is helping Bob to learn more about his antennas. K2AZT is now using a Communicator II on 6 meters. A new Drake receiver is in use at K2CML/K2DNY. K2ZLE added a new 6-meter beam to his station. A Cosmophone 50 is now on the air at W2ZRA. K2LHA has been signing into the V.H.F. Net, providing a badly-needed upper Manhattan outlet. Our V.H.F. PAM, W2EW, requests that all interested persons join the net. K2SJP is enjoying fine results with his 6-meter walkie-talkie. A new 100V is in use at W2JVO. The Hudson Amateur Radio Council is planning the first New York Hudson Convention to be held in more than ten years. Keep Oct. 15 open for the HARC's first convention. All mobileers are urged to switch to safety with rigs and cars now that heavy summer traffic is near. Traffic: (Feb.) K2VCO 712, W2VDT 365, K2UBG 231, W2EW 223, W2WFL 175, W2GP 75, K2KXT 45, W2AGPT 39, K2QBW 33, W2OME 32, K2BH 28, W2BQ 26, W2OBU 22, K2MYW 19, K2PHE 18, K2HRS 16, K2SJP 14, K2RKL 13, W2ABVH 11, W2EC 11, W2UAL 11, K2CML 10, W2PF 10, W2HNG 9, W2LGK 8, K2RHG 8, W2BST 7, W2CSE 7, W2DEM 7, W2IMO 7, K2AZT 6, K2IUT 6, W2FAV 5, W2DXH 4, K2LHA 4, W2EUL 3, K2PIL 3, K2AAW 2, K2KVL 2, W2MDM 2, K2PKJ 2, K2THY 2, K2YQK 2, W2ZRA 2. (Jan.) W2BQK 70, K2MIG 19, K2RDP 13, K2PTS 1.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr. W2ZW—SEC: W2APY, RM: W2HXL, PAMs: K2KVR, W2REH and K2SLG. NJN held sessions with an attendance of 619 and handled 541 messages. NJPN had 29 sessions with 618 in attendance to handle 90 messages. NJ 6 and 2 had 9 sessions, 120 attendance and 33 traffic. K2UCY is now OBS, ORS and OO and writes very informative letters to the SCM. W2RXL is teaching an adult education class in radio at high school. K2ETS is begging for parts for the Neptune High School Electronics Club. K2EQP is using RTTY. K2ZMO is back on the air with 300 watts but no phone. K2CBG made RCC. K2LXL says good-bye to 10-meter DX—his beam toppled. New officers of the Jersey City Radio Club are K2QGD, pres.; W2ECO, vice-pres.; W2ZAL, treas.; W2IJJ, secy.; W2EVO, act. mgr.; K2KOS, public relations. W2VMQ got a new Ranger and a 73A-4 and immediately worked the Isle of Man. W2TKZ, after nine attempts, has a v.f.o. that suits him. K2PTI is busy rebuilding the SX-25. W2CFB has so much repair work to do on the rig he can't get on the air. K2GIF has been under the weather but is back in shape now. K2VVL made the BPL. K2IGG is now General Class and soon will be on the low bands. W2BVE now has a tape recorder. W2CVW operates K3WAG. K2CEP is trying for commercial licenses. W2ADE moved and now has to put up his antennas. W2ACOO lost his 170-ft. l.w. seven times in one month. W2CCF made the BPL on c.d. origins. K2VAB is operating on the rig, not the air. K2AGJ sounds much better on 80 meters with a new antenna. K2MFF made BPL the hard way. K2THC worked K84AZ on 20-meter c.w. W2ZCH has harmonics on 7 mc. and will be off until he gets an antenna tuner. Traffic: (Feb.) K2MFF 632, K2UCY 357, K2ZHK 264, W2ACOO 251, W2RXL 216, W2APY 177, K2VVL 151, W2CCF 138, K2VNL 120, W2EBG 80, K2THC 80, W2CQB 76, W2ANG 62, W2DRV 54, W2BVE 50, K2ETS 43, W2BRC 39, K2LWQ 39, K2IGG 29, W2ZCH 29, W2BSC 24, W2ZVW 22, W2CFB 21, K2JTF 20, K2SLG 18, K2EQP 16, W2RZO 15, W2AAM 14, W2AZZ 11, K2LXL 10, W2RON 10, K2VAB 10, K2CEP 9, W2WOJ 9, K2CBG 6, K2AGJ 4, W2CVW 4, W2EWZ 3, W2CJX 2, W2NIY 2, W2TKZ 2. (Jan.) W2DRV 34, K2IGG 30, W2RON 6, W2CFB 5, W2WOJ 2.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W6BDR—Officers of the 75-Meter Single Side Band Net are K6JVO, pres.; BEG, vice-pres.; K6Q and WFTLG, net directors; KJN, emergency dir.; NGS traffic manager; CRG, technical dir.; REM, K6POB and SOA, membership committee. The net meets at 1900 CST on 3970 kc. daily. The 160-Meter Net had 710 QNS with 29 messages handled for February and now holds a Sunday session at 1300. The Central Iowa Emergency Net meets on 3590 kc. at 0830 each Sun. BXR was elected president of the Davenport Club. The Wapsi Radio Club of Independence has been approved for ARRL affiliation. K6RTF now has a Heathkit Seneca 6- and 2-meter transmitter. VQX now has a ten-element 2-meter beam. OFW is on radioteletype with a 7-watt transmitter. New officers of the Central High School Club of Sioux City are K6LFA, (Continued on page 130)

ONE MAN *tells* MANY OTHERS!

Dow Coaxial Relay

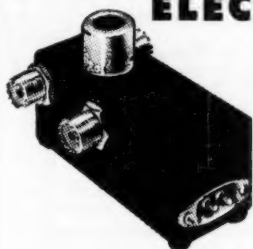
"What do you recommend as the best coax relay for ham use?"
 Unquestionably the Dow relay No. DK60-G2C. I've tried a large number, but personally have found this one to be THE best. Built for 1000 watts of rf, this relay can take it! I have purposely abused this relay to find out what it could do—and it came thru unscathed and still operating smoothly, quietly and without perceptible rf loss. In its price range I doubt that any other relay can touch it. I especially like it for vox operation on SSB—it is truly a little giant—easy to mount and long lasting. I DO prefer it to a TR switch using a tube. Show me a better relay for the same money and I'll buy one! This, I am convinced is the relay for the novice as well the advanced ham—"you pays yer money and you gets 'sumptin really worth having'."

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Employs circuitry with large signal handling capabilities to reduce locally-generated cross modulation types of interference. Standard UHF connectors.

DKC-TRP is designed to operate in 1.8 to 30mc range. Practically instantaneous operation.

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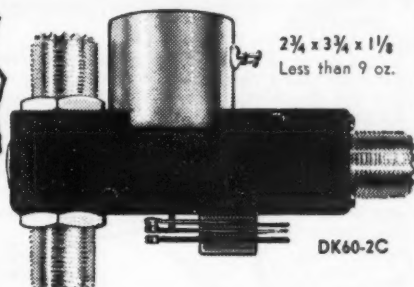


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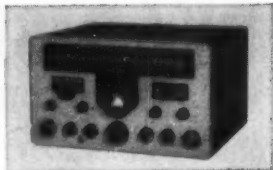
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pres.; MTM, vice-pres.; DPH, secy.; QAI, treas.; IIN, chief op. MJH and VRA renewed their EC appointments. KBJRT received an OO appointment. LCX appointed QVA, PKH and KGBD as a committee to plan the Annual TLCN Party. GXQ has completed his basic training in the Air Force. Traffic: (Feb.) W0LGG 2635, SCA 182, LCX 1682, BDR 1335, K0MMZ 134, AUU 79, W0NTB 54, BLH 33, QVA 33, K0EAA 20, W0VQX 21, JPJ 18, K0BSZ 16, W0FMZ 16, K0APL 15, W0REM 15, K0QKF 14, W0NGS 11, K0GXP 10, KAQ 9, W0PTL 9, YDV 9, K0OTV 8, SEW 8, UTD 8, W0EEG 7, HTP 5, K0GHH 4, JCQ 4, W0QVZ 4, K0GOT 3, W0GG 3, K0LXL 3, W0SLC 3, K0JGM 2, RFB 2, BRE 1. (Jan.) W0YDV 7.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: IFR, Asst. SEC: LOW, RM: QGG, PAM: VZM. V.H.F. PAM: HAJ. The 144- and 220-Mc. boys really had an opening Jan. 30-31. The Flint Hills Club elected E.C.D. pres.; K0OMJ, vice-pres.; K0SWR, secy.-treas.; K0CKN, net. mgr.; K0HLC has a new HT-37. The following Hutchinson amateurs assisted with the Cerebral Telethon, this year, K0LME, CMM, KHQ, QBP, QGJ, SHB, LMS, W0AWB, KMB, IUL, UML, INL and TFW. K0CCM won an RCA-VTVM in the Operating Contest. UFP has three 811s now in readiness for the coming season. UPU is sponsoring a change in the Topeka High School Radio Club; the new name will be the Top-Hi Radio Club. The ACARA, Wichita, has as its guest speaker K0EMF, who spoke on "Electronics in Medicine." The Hi-Plains Club elected 5VVW, pres.; 3ZTW, vice-pres.; K0TBU, secy.; K0EWW, treas.; GFU, pub. chairman; NIO, NCS for the 160-Meter Emergency Phone Net. Traffic: (Jan.) W0BHI 1436, K0HVG 169, W0FNS 133, SAF 114, K0HGI 112, W0GQC 91, K0KED 88, W0SYZ 86, ABJ 66, TOL 65, UTO 64, ORB 60, K0GYA 50, LJH 46, BXF 40, W0VZM 37, K0SMQ 29, IRL 26, MIXT 24, 5RDP 23, W0JZM 21, JTW 21, K0RHQ 13, W0ECD 12, K0TNW 12, W0FER 11, FDJ 11, K0GIG 11, W0JGJ 10, RJF 10, K0EFL 9, W0STC 9, WFD 9, K0QKS 8, QOB 8, W0BBO 6, FHT 5, K0LHF 5, JID 4, GEL 3, W0ASY 1. (Jan.) W0FNS 183, K0BFX 32, IQA 10, W0ASY 2.

MISSOURI—SCM, C. O. Gosch, W0BUL—SEC: K0LTP, RMS: OUD and QXQ, PAMS: BVL, OMM and K0LLQ. Net reports: MON (3580 kc., 1900 CST M-8) 25 sessions, QTC 157, QNI 18, NCS: K0BLJ 1, K0OIC ARO 3, K0ONK 4, OUD 6, K0QCC 6, K0KBD 3, SMN (3580 kc., 1600 SCT Sun.) QTC 11, QNI 10, NCS OUD, HBN (7280 kc., 1205 CST M-F) sessions 21, QTC 491, QNI 603, NCS K5JXD 1, K0JTW 4, K0LTP 5, K0LTP 1, K0BFH 2, QJU 2, K0FCT 4, K0HVG 1, K0ONK 1, MEN (3885 kc., 1600 CST M-W-F) 13 sessions, QTC 219, QNI 424, NCS OHIC 4, OVY 3, K0OLW 4, OMY 1, VPQ 1, K0OLW is now NCS, with DFK as NCS. For the Monday session of MEN, Novice code and theory classes are being conducted at the local YMCA under the sponsorship of the Tri-State Radio Society (Joplin) with DE as instructor. GAR and TSZ were active on MON, RTW, along with many others, was confined with the flu. K0FCT, Grandview, showed the section what traffic totals really are. K0DEW was active on 75-meter phone with a new sky-wire. GEP is moving hence amateur activity will be curtailed temporarily. K0PFF is building a new a.s.b. exciter. Reports have fallen off somewhat. Please tell us about any activity, including traffic, fellows. Traffic: (Feb.) K0ONK 1082, LTJ 692, W0MM 506, WAL 254, ZBR 165, OUD 102, K1L 101, BVL 98, K0BLJ 94, IHY 66, W0OVV 61, BUL 55, ARO 54, PXE 54, VPQ 54, WAP 25, K0MMR 14, RXI 12, W0FEF 10, VFP 4, K0RFS 2. (Jan.) K0FCT 2978, BLJ 71, OJC 15, MMR 10.

NEBRASKA—SCM, Charles E. McNeel, W0EXP—NIK, NC for the Western Nebraska Net, reports for Feb. QNI 782, QTC 729. The following stations reported 100 per cent: K0AIE, K0BMQ, K0DFO, DVB, K0ELU, GGP, NIK, OCU, OFP, PZH, K0RRL, K0TUB and K0WPG. NYU reports the Nebraska Section C.W. Net had 28 sessions with QNI 278, QTC 201. The 160-Meter Net reports QNI 167, QTC 5 for Feb. The 75-Meter Morning Phone Net had QNI 746, QTC 173, as reported by K0LDG. ZOU reports the Nebraska Emergency Phone Net had QNI 576, QTC 47. IAY reported 100 per cent of the time. UEV, IYB, AGP and K0LDO attended the Feb. 26 meeting of the Pioneer Radio Club in Fremont, where K0LDO delivered a talk on the advantages of single sideband that was enjoyed by all. The N.E. Nebraska Radio Club is now 100 per cent sideband. Traffic: (Feb.) W0GCP 728, NYU 397, RDN 356, K0QFK 291, (Continued on page 132)

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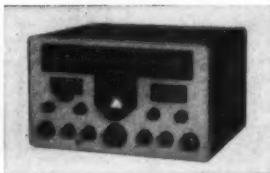
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see page 119

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NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ —KIWCM, OBR and YBH made the BPL, LGE QSOed G3EHY on 6 meters cross-band and a VE2 on 2 meters. YOL is back on 6 meters. BFS added GD, GC, HP, VP2 and OE to his DX totals. His 13-year-old son, KNINJO, is well on his way to WAS. FHP reports CVN had 93 stations check in during 12 sessions and handled 14 messages. RLD is active on RTTY. BDL enjoyed the ARRL DX Test and the RTTY Contest. KNIMNX has a new 15-meter vertical. KICKZ is on 6 meters with a Heath "sixer." KINMO is on 2 meters in Wallingford. WHL advises that the 6-meter net moved 23 messages during February. FVV found his 6-meter halo better than a whip for mobile work. KIMOT worked a G and DL for his first DX. K1HWY, attending Ward School of Electronics in Hartford, is active on 2 meters. KYQ reports the CN first session handled 447 messages during 29 sessions, with an average attendance of 16.3. The second session handled 140 messages during 27 sessions and had a 5.3 average attendance. High QNI goes to K1JAD, K1HWF, K1GGG, OBR and RFJ. MBX built a 220 Mc. Kihbook rig and an eight-element beam. He is building a receiver now. QNG runs 600 watts to a pair of 813s on 15 meters. QPD soon will have a Mosley TA-33 on his 80-ft. homemade tower. K1CWQ and K1CWR, father and son, have a new G4ZU beam. The Scouting team ARA held a QSO Contest with the Radio Society of Bermuda. DNJ is on s.s.b. using a Gonset exciter and Thunderbolt final. GVZ needs two more zones for WAZ. ZTG has been working DX using 5 watts. KNILOM QSOed KZ3MQN on 40 meters. YBH advises that CPN met 29 times during February, handled 389 messages and had an average attendance of 30 stations. On the honor roll are K1BSB, K1CAK, FHP, YBH, K1AEQ 28, VQH 27, DAV, K1DGG 26, K1GCS, LWV 25, EVH, IHG, 24, K1GKH, mobile at the scene of a plane crash near New London, and K1GUV provided communications for a two-hour broadcast through the local station. RJY has a new Valiant. AW was active in the DX Contest (phone and c.w.), the RTTY Test and the Novice Roundup. EFW spoke on the Geneva Conference at a meeting of the Waterbury ARC. JSU vacationed in Florida. K1JBN paid a visit to WAZCPT and WAZFGO. New appointments: KYQ as EC for Bristol; K1AGE as ORS; K1IJG as OO. Appointments renewed: K1BEN as EC; QPD as OO. Reports received. OES from FVV, LGE and YOL; OO from K1EFI, K1JBN, MBX and TYQ. Traffic: W10BR 626, K1WCM 576, W1YBH 318, EFW 314, KYQ 275, AW 235, TYQ 102, ROX 94, K1HWF 89, JAD 79, K1ICHR 76, K1LH 57, GGLH 45, W1HP 40, RFJ 34, BDI 31, VTY 29, K1DGC 23, CAK 21, BSB 17, W1CJD 17, CUB 16, K1AEH 14, W1WAZ 14, HJG 7, K1CBV 6, W1GVJ 6, K1MOT 6, W1EJH 4, K1MJJC 3, W1RFS 2, K1NMNX 2.

MAINE—SCM, Jeffrey I. Weinstein, W1JMN—SEC; JMN, PAM; BXL RM; EFR. The Sea Gull Net meets Mon. through Sat. at 1700 on 3940 kc. The Pine Tree meets Mon. through Fri. at 1900 on 3596 kc. The Maine Slo-Speed Net meets Tue., Thurs. and Sat. on 3726 kc. at 1730. Let's have more OPS, ORS, OES, OO and OBS appointees in Maine! If you're a League Member and not an Official Appointee, you're missing out on many exclusives that are available to you. Contact your SCM for applications. A New England Area phone net is now on the planning board of the 1st Regional Net Manager to help facilitate the distribution of traffic throughout New England. Details will be given when formulated. KNINJL is a new ham in Scarborough. KNINLT and KILPR are new in Westbrook. FNI is active evenings on 2 meters. GVQ and KSG have new Wonderbars for 10 meters. CXX has a new 'scope modulator monitor. Officers of the SPARK are K1LHE, pres., K1KWZ, vice-pres., K1KAK, secy-treas. The AARA is pleased with its new Globe Scout. How about the Maine radio clubs delegating their secretaries to send in monthly activity reports relating to past, present and coming events to their SCM? It would help immensely in compiling an accurate summary of happenings throughout the State. ECs are needed in several counties. Is your county one of them? Field Day and the Augusta Ham-fest are just two of the upcoming events. The AARA intends to all. See you then! Traffic: (Feb.) W1UDD 73, ISO 59, K1KSG 48, BDQ 45, EFZ 42, W1LWD 36, GRG 18, K1GVQ 16, GSF 13, JMB 13, K1NMBZ 12, K1BYE 4, W1OTQ 4, JMN 3, K1DYG 2, W1TKE 2 (Jan.) W1KFY 29, K1JMB 11, W1OTQ 6.

(Continued on page 134)

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- Rated wind velocity 100 MPH with $\frac{1}{2}$ " of ice
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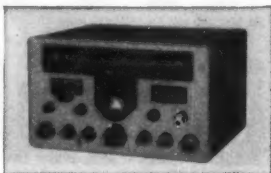
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see page 119

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AMERICAN RADIO RELAY LEAGUE

West Hartford 7, Connecticut

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AOG. New appointments: ZSS as PAM for 2 meters, LJS as EC for Sector 2-B, KILJK Rehoboth as EC, KIHCH as OO and OBS, UIR as OPS. LL as ex-LSA, now is a Silent Key. KBS now is in Florida. 6BXJ visited the South Shore Club. ZWQ has a Volant and a Telrex beam. Ex-AJ is now KACS in St. Petersburg, Fla. AFO now is in Sudbury. AQE has an REF certificate. WA6CQF was in town. What is ex-DHX's W6 call? JHU and KICOH are on 75 meters. Heard on 2 meters: MEM, AEZ, NXM, PBC, ELV, VSV, FCJ, K1s GQW, AEK, GUU, LWJ, GDR, BRO, JIX, EKO, KYB, JPX, NBU, IEB and KN1NGM. GDY has the call GE in Warner, N. H. AR will have been a ham 50 years on June 15. The Cape Cod 6 Islanders ARA held a meeting. OHX has a DX-40 on 10 and 40 meters. K1JUM has a Mosley TA-33 Jr. The Beverly C.D. group had a Geiger counter hunt. The Chelmsford Amateur Club heard a talk on "Challenge of Undersea Warfare" by W. Stetson. MQV is in the Century Club. K1s BNA and KHQ made General Class. BGW is chasing DX on 20 and had a QSO for 1½ hours with C3CQE on 20-meter RTTY. K1JJS's father is KN1XJE and his mother is waiting for her call. K6AVF, ex-1KCP, is looking for the gang on 15-meter s.s.b. New officers of the M.I.T. Club, MX, are K9CDI, pres.; K2KIR, secy.; W3ZGI, treas.; W4VQZ, stn. mgr.; W9MGS, act. coordinator. This society, which was founded in 1909, has a 60-ft. tower up and beams. The T-9 Radio Club met at WNK's. K1IDA is on 75 meters. The Framingham Club held a meeting on "Field Day" with H. taking charge. The QRA had FZJ as a speaker. The South Shore Club had an Old-Timers Nite with the following among those present: IS, BA, MME, FWS, GRA, AAH, IYU, MB, WK, QZO, ALP, CC, OTZ, DDO, JMA and LMG. IS is living in Quincy now. AKY and MME went to Florida. K1KHH will be on soon. K1MEM is 11 years old and has a DX-40 and SX-99 and General Class license. K1s JFF, JBL and KN1MG are on 2 meters. K1OIE has a new linear on 2 meters. K1GUG and KN1KSJ set a new QSO record on 54 hours on 2 meters. OFK and TWG are OBS on EM2N. K3CBC/1 is working in Waltham and has a rig in the car for all bands. The Medford Amateur Radio Assn. is now affiliated with ARRL. LUS is secy.-treas. NKA reports an informal net on 50.25 Mc and will have 50 watts on and mobile. The Eastern Mass. Novice and Slow-Speed Net meets on 3733 kc. Mon., Wed. and Fri. at 6:30 p.m. K1MMQ is in charge. 3MVK and KIHCH are operating K1BO. KIHCH takes traffic from K2UBG. K1JAW has two qualifying months for Traffic Hounds Morning Watch membership. NJL has beams up 45 ft. K1BYV is busy at school. K1DIO and GYM are active in MARS. K1JLU has a beam for 10 meters. WZA is his dad. K1CWS has a beam on the tower. K1HSS and PXH are on 2 meters. UC is on 75 meters in Milton and has been on the air 53 years. UGH is on 75 meters. W4YZY is in Falmouth. Appointments endorsed: RM Newton, LOS Sharon. PSG Gloucester, WK Quincy, HKG Malden, DBY Chelmsford as ECs; MX and AUQ as ORS; MX as OPS; K1DIO as OES. CGF, Taunton, is on 75 meters. K1KAS took the Tech. Class exam. K1KUG is N.C. in the Back Fence Net on 29 Mc. FJJ made DXCC. K1GTX lost his appendix. OFK is a new OO. K1JML a new OES. K1CZO has a Globe Scout 680A and a Gonset II, with beams for 2 and 6 meters. IPZ has been endorsed as EC for Shirley. KN1NNJ has a DX-20 and a Knight receiver. K1DNG reports the College Traffic Net is on 50.40 Mc at 1830. K1KPD and KYN have General Class licenses. KN1NLP is the brother of K1LWJ. VSV is in Winthrop. K3ND 1 is on 10 meters in Winthrop. The Yankee Radio Club held a Ladies Night. The Needham Sr. High School Amateur Radio Club (MTT, pres.; K1LKL, vice-pres.; K1LKK, secy.-treas.) meets each Mon. The club had a rig on 20, 10 and 6 Mar. 17-19 for the Science Fair. Traffic: (Feb.) K1MMQ 1619, W1PEX 739, EMG 366, K1JAW 244, WN1JL 281, EAE 225, K1BHH 184, BYL 153, W1OFK 150, ZSS 129, UIR 124, K1GKR 116, K1B 88, JOV 84, W1AUQ 79, K1BYV 69, HSV 54, BGK 50, GVR 50, DTJ 45, LLX 44, W1RQL 44, SIV 43, K1MHH 39, W1HGO 35, K1DIO 34, GYM 30, JIU 23, WITW 22, AAR 20, AOG 20, K1MHC 19, W1QPU 16, K1LCO 15, CMS 14, DNG 13, EJW 10, LJK 7, W1MER 7, FJJ 6, K1HWE 5, CWS 2. (Jan.) K1BYL 90.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH. RM: DVW. PAM: DNX. WMN meets on 3560 kc. at 7 p.m. Mon. through Sat. MPN meets on 3870 kc. at 6 p.m. daily. Pittsfield, Springfield and the north central areas now are covered nicely on WMN. Worcester, and all but the Pittsfield Area, are nicely covered by MPN. MPN handled 348 messages during February with an average attendance of 15.83 stations and an average of 11.6 messages per session. The Annual Spring Meeting of the Mass. Phone Net will be held Sat., May 14, at Grandview Hall, 21 Grandview Ave., Worcester, beginning at 1 p.m. Registration is 50¢ at the door, dinner on an individual basis (Continued on page 130)

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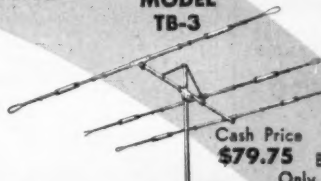
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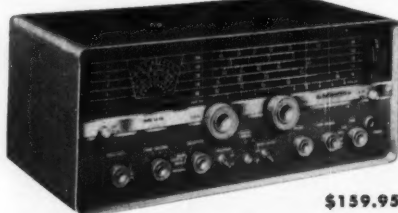
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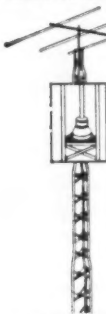
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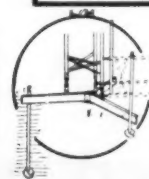
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at a local restaurant. Contact DXS, WM PAM. AJAX and KIGCV turned in nice OO reports. DXS has ordered a new Heath 6-meter transceiver and mobile power supply. I would appreciate reports on the activity of the Hampden County Radio Association. KICAU is very active on three phone nets and one c.w. net. IPN put on a ham radio assembly at the Mount Hermon School which was a big success. From May 21 at 2200 hours EDST to May 22 at 1600 hours, the Mount Hermon School ARA will sponsor an emergency-portable training activity contest, in which members will compete against each other to work the most stations with one of the three portable club stations, WIIPN/1. All contacts with WIIPN/1 will be confirmed by a hand-some certificate. Contacts will be brief to permit maximum number of contacts by each of the three stations in competition. Don't forget, you appointees, that you agreed on your applications to send in monthly reports. Many of you are slipping on this. KJGW has a new SX-111. KJDB is a new ham in Sheffield. FDG has been picked by his congressman to enter West Point. Congrats. DPY reports that Sector 4E is quite active in c.d. GTO has a 25-milliwatt transistor 50-Mc. transmitter working well. BKG and HPA gave ham radio demonstrations to a group of Explorer Boy Scouts of America and a group of Senior Girl Scouts of America. Traffic: WIDXS 366, KICAU 337, WIVBR 182, DWV 110, KIJV 87, LBB 55, WIZPB 35, AGM 33, WEF 29, OSK 5, KJDC 1.

NEW HAMPSHIRE—SCM, Robert H. Wright, WIRMH—RMS: KIBCS and KIKH. PAM: 11Q. V.H.F./PAM: TA. The GSPN meets at 1900 Mon. through Sat. and at 0930 Sun., on 3842 kc. The NHN (c.w.) meets nightly at 1500 on 3655 kc. Welcome to new hams KINHJ of Piermont and KNINOS of Henniker. KILAS now General Class. The requirements for the GSPN certificate award have been reduced to 20 confirmed contacts with bona fide net members on 80 or 75 meters, or ten contacts on the higher frequency bands. Certificate No. 2 has been awarded to KIBCP and No. 3 to KIDKD. The Manchester Radio Club held its 21st Annual Banquet Feb. 27 with 85 in attendance. KINB of Derry, has moved to New Hampshire from W2-Land. The Willimantic Conn. Jaycees presented KIGGJ of Manchester the Worked All Conn. Award. TA is trying to revive the old Northeast V.H.F. Net. The NHN reports 20 sessions and a traffic total of 32 for February. GSPN reports 24 sessions and 113 traffic for February. I will appreciate it if all club secretaries would let me know who their club officers are. Traffic: (Feb.) KIBCS 1172, IIR 516, CIF 309, WHIQ 32, CUE 16, AIJ 14, KIDKD 14, CFX 12, IEH 12, EEN 5, IEI 2. (Jan.) KICFX 12, WIAIJ 7, KIEH 5, IEI 4.

RHODE ISLAND—SCM, John E. Johnson, KIAAV—SEC: PAZ. RM: SMU. PAM: YRC. Congratulations are in order this month to KIBBK and his XYL on the arrival of a new baby daughter. WRI Cert. No. 6 was issued to W6NGC for working R. I. stations. AQ announces that a membership committee of KICZB, LXQ and LFW was formed. Classical High School RC of Providence elected ZPT, pres., KIHZN vice pres., JWZ secy., KJTL, who recently passed the General Class exam, was appointed trustee. VBR has been appointed NCS of a MARS C.W. Net and R. I. representative of the MARS Army Traffic Net. SMU was appointed dir. of the Eastern Area ICC. KILSM will be leaving R. I. for Memphis, Tenn., in April. RIN Net reports a total traffic of 222 messages in 21 sessions. RIN members include HLY, QR, SMU, KILSM and BBK. Traffic has been slow for February but with the storm that hit R. I. the first a definite increase in traffic was noted. The PRA announces that its 39th Annual Dinner Dance will be held May 21, 1960. Contact HIK for tickets. Traffic: WISML 709, WISML 678, TXL 61, TGD 40, KIBBK 29, WIVBR 19, WED 15, KIAAV 5.

VERMONT—SCM, Harry A. Preston, jr., WVISA—SEC: EIB. RM: KIBGC. PAM: HRG. Vermont frequencies: C.w. 3.520, phone 3855, RTTY 3620. Nets: C.w., M-W-F 1830; VEPN, Sun. 1730; VTPN, Sun. 0900; GMN, Mon-Sat. 1730. WA6FRP (ex-WIVXK) is now living permanently in Bennington after moving from California and is running 600 watts c.w. 80 through 10 meters; 50 watts phone 75 through 6 meters. PFN is now finalist for a college scholarship in the National Merit and semi-finalist on the General Motors and Hertz Foundation scholarships. BKZ has been accepted at Union College, Schenectady, N.Y. AAJ has been heard often on 10 meters. KIBVH, of Rutland, has a new Globe Chief, a Heathkit transceiver and has built a home-brew linear with a pair of 400As. Another new ham in Rutland is KN1AL. DWR has finished building and installing a 10-meter converter in his auto. NWW has been enjoying a vacation in Florida. YVU is active on the ether waves when the OM and harmonics have gone (Continued on page 138)

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COSMOPHONE "1000"



- ▲ A Self-contained 1 KW Transmitter-Receiver
- ▲ A True Table-top Station with NO Sacrifice of Performance

SPECIFICATIONS

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INPUT: Full 1 kw on Voice Peaks (Meters Read 2500 V at 400 ma) into a pair of 4 x 300 A's
UNWANTED SIDEBAND: 42 db down
DISTORTION (SSB): Third order products approx. 32 db down
FREQUENCY STABILITY: Drift less than 100 cycles.

CALIBRATION: Built-in 100 kc marker
AUDIO CHARACTERISTICS: 200-3100 cps

MIKE INPUT: High impedance
VOX: Built-in
LEVEL: Automatic level control
METERING: Screen, plate, and grid current, plus RF output
RF OUTPUT: 52 ohms
VFO's: Dual VFO's permit transmitting on the receive or any other frequency
CONTROLS: Vox, Q1, ALC, Grid Tuning, Plate Tuning, Antenna Loading, Audio Gain, Band Switch, Meter Switch

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SENSITIVITY: 1 microvolt for 6 db S/N
SELECTIVITY: 3.1 kc mechanical filter plus a T-notch filter
STABILITY: Drift less than 100 cycles from a cold start at room ambient
TUNING KNOBS: Coarse gear ratio of 20:1, fine gear ratio of 100:1 gives a 1 kc dial reading per division
CALIBRATION: Built-in 100 kc marker
IMAGE AND IF REJECTION: Better than 50 db
AUDIO DETECTOR: Balanced detector for SSB and CW, diode detector for AM
MODE SWITCH: Selects up or low SSB, or up low AM, or CW
DUAL RECEPTION: Two VFO's permit reception of any two frequencies on one band with the flick of a switch
BFO: Crystal controlled
METERING: S-meter
CONTROLS: T-notch filter, audio gain, RF gain, antenna trimming, tune selector, phone jack, tune A and B

"The COSMOPHONE 1000"—a complete Station, Receiver, and Transmitter. Dimensions: 17 inches wide, 12 inches high, and 15 inches deep. Power Supplies packaged separately, can be placed under operating desk. Price: "The COSMOPHONE 1000" with Power Supplies...\$1,550.00.

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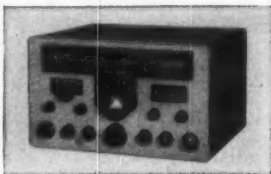
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see page 119

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Type CA Bumper Mounting, Chain Style	
Type R-200 Universal Ball Mounting —	\$6.60
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Type SA-2 Heavy Duty Stainless Spring Adapter	7.50
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GP-430 — Light weight Aluminum Ground Plane	
Antenna fully adjustable from	
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Antenna — Efficient and inexpensive	
108-120 MCS	4.80
GP-314 — Same as above — 144 MCS	4.80
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Types M, AL and SS Telescoping Vertical Antennas are	
available in Steel, Aluminum and Stainless ranging from	
12' to 35' in height.	
Safeguard your Base Station Equipment with a Premax	
Ground Rod, 3/4" to 1" diameters, up to 8' in length.	

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to work and school. KIAJL has a new 600-watt phone signal on the air. Traffic: VE2AZI/W1 439, W10AK 181, K11RH 47, GBF 43, BGC 33, W1VSA 31, HRG 30, FPS 23, KJG 17.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—A surprise statewide C.D. Alert brought 30 checks in from 25 counties to OA at headquarters station in Boise. All ECs and ROs should contact the sheriff or c.d. director to be put on the calling list. Then when the Alert originates, meet on 3997 kc. for further orders. Pocatello reports four 2-meter stations on the air and new hams are KN7KQG, KN7KVS and KN7LCW. The Pocatello Amateur Radio Club's new officers are K7CXG, K7JIL and K7GCE. The FARM Net elected WEY manager, and LIQ net control. Thanks to retiring officers JHY and K7GQM for a job well done. DWE is c.d. director for Madison County and is mobile again with Heath twins. DTJ and EMT have new rigs on the air and are getting good reports. GMC built an electronic key. VQC is organizing RACES and AREC activity in Moscow. FARM Net traffic: 121. Traffic: (Feb.) W7GMC 122, K7BWV 53, W7VQC 28, EEQ 23, GOV 21, EF 20, LIQ 19, DWE 14, EMT 10, ZRQ 9, EYP 7, JFA 6, KBY 6, DHL 5, K7GHX 1. (Jan.) W7GMC 176.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1 —SEC: KUH, PAM: YHS, RM: Vacant. MPN meets M-W-F at 1800 on 3910 kc. MSN meets T-T-S at 1830 on 3530 kc. YHS was appointed PAM. K7GYE was appointed EC for Forsyth. K7BKII made his 8th consecutive BPL. NLA got married. KN7LIU is a new call in Terry. Ham dinners were held at Ulm and Billings. HJM and ZJZ visited in Washington. K7EYX visited in Idaho. YLH moved from Billings to Helena. VDZ moved from Billings to Casper, Wyo. K7EUB is in the hospital at Billings. NML built a new 300-watt final. KUH has a new 850-watt rig. EPY is building a kw. final. CQC has a new Ranger. HDP started a 6-meter net. New officers of the Butte Amateur Radio Club are QCY, pres.; AEH, vice-pres.; K7EGG, secy.; and K7EGD, treas. Ham picnics are scheduled as follows: Harlo June 5, Wolf Point June 19, Lewiston July 10 and Havre Aug. 7. The Glacier Hamfest will be held at Appar July 16-17. Traffic: K7EWZ 475, BKH 179, BYC 39, W7TVX 39, K7CTI 37, W7SFK 24, IDK 8, TPE 4, YQZ 4, NPV 3, K7JBH 1.

OREGON—SCM, Hubert R. McNally, W7JDX—There was a little slump in activity in February; too much winter snow and ice perhaps. Several antennas were lost, including that of the SCM. The Webers, K7CLL and K7IWU, were not bothered and turned in a good month. Ken reports that ex-DRS is now DLABS, so be looking for Russ, gang. Several of the new OES are making regular reports, such as K7s EEP, GSR and EPA. Wish more of the OES would get in some reports. EPA reports that his new 432-Mc. rig is about finished. We regret to announce the death of UHK, of Bonneville, Oregon. UQI had a fine AREC report for Feb. and expects to complete the yearly report for 1959 soon, which should place Oregon well up in AREC activity. K7CSM has resigned as OBS, likewise EXH as EC of Clatsop County. GWC will be the EC there. K7CLL is a new OPS appointee. DIC and AJB took part in several AREC activities in Lane County. Those gals are really on the job. K7AXF is thinking about taking the EC job in Coos County to succeed the late BLN. The Affiliated Council of Radio Clubs in Portland held a final meeting on arrangements for the Oregon State Convention to be held in Portland Apr. 30 and May 1. Traffic: W7BDU 532, ZB 425, K7CLL 335, AXF 178, W7MTW 91, DIC 36, AJN 24, K7IWU 23, W7DEM 21, LT 20, K7CJB 6.

WASHINGTON—SCM, Robert B. Thurston, W7PGY —The SEC, HMQ, is putting on a drive for AREC members. Clubs or counties not having an Emergency Coordinator for their territory, please recommend one to your SCM or SEC for appointment. The 13th Annual Banquet of the Valley Amateur Radio Club was held at Ingham's, near Sumner. The following officers were elected: DQV, pres.; PUA, vice-pres.; K7JCTH, secy.; BUG, treas.; K7DOB, sgt. at arms. New officers of the Skagit Amateur Radio Club are REC, pres.; CZY, vice-pres.; K7JJO secy.-treas.; KN7KXN, sgt. at arms. The Boeing Employees Amateur Radio Society (Bears) is planning and installing a club radio station. The Washington State Net (WSN) had 21 sessions with 317 QNIs and 168 QTCs for the month of January. OMO is planning a code and theory class in Warden. K7CHH has a new Hy-Gain Tribrander and is sweating out DXCC-105/78. BTB holds regular skeys with Alaska and Guam. A new ham in Prosser Area is KN7KTA. The new Ten-Meter AREC

(Continued on page 140)

TALK IT UP WITH THE ALL NEW

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Model TH-3

Wt: 29 Lbs.

\$89.95 \$9.00 Down
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Guaranteed less than 2 to 1 SWR on all bands with no tuning or adjusting necessary. Excellent broad band characteristics. Designed for 52 ohm coaxial line.

Quick and easy assembly and installation from clearly written instruction manuals complete with drawings and photos.

Slim Traps

Unconditionally guaranteed to be completely impervious to all weather conditions. The new "solid state" slim traps are the world's smallest, lightest weight trap assemblies (1 1/2" in dia.) The highly efficient coil and capacitor are wound on and completely imbedded in the new low loss polypropylene plastic. Withstands Maximum Legal Power. Thoroughly tested with leading commercial transmitters... Withstand 1000 watts CW or AM and 2000 watts SSB.



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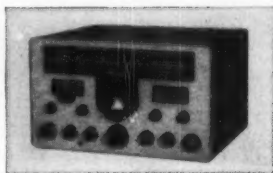
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see page 119

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Chris would have made a good "ham" ... the kind of fellow who is always looking for new worlds to conquer! Old Columbus proved himself a tight man with a dollar (or was it Spanish doubloon?) when he went to see Queen Isabella. That means he'd want to cash in on the extra big savings of a Walter Ashe "Surprise" Trade-In Allowance!

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Net meets on 29. 4 Mc. Tue. at 1030 PST in Tacoma. KTAPJ is awaiting confirmations for his DXCC certificate. GAT renewed his ORS appointment. EYV was off the air for a sojourn in the hospital. On the morning of Jan. 31 RGL's QTH was partially destroyed by fire and Paul will be off the air for two to three months. K7ABB has a new Model 15 teletype machine and was active in the RTTY SS. GD is on the air with an Apache and an NC-183. VPW is back in the traffic game and running a kw. on c.w. and 300 watts on phone. FLX is very QRL with work. PANN and MARS. AMC reports that after forty years he has obtained an old Navy mill for use in traffic work. The following stations are QRL lining out emergency gear: WDQ, WRF and SZX. Don't forget the WARTS Picnic for July 9 and 10 and the Bremerton Hamfest on May 21. BSW is building a new kw. rig with 4-400 modulators and a 4-1000 final. K7CWO is QRL college. JPH renewed his CO appointment. KZ will be QRT for FAA School until May. SAP is the owner of a new kw. generator. K7CFC worked KH6BVS on 40-meter mobile. The Seattle To-tem Emergency Net again is operating on Tue. at 2000 PST with NUN as Net Control Station. The Washington Amateur Radio Traffic System (WARTS) had 23 sessions accounted for and 1791 check-ins, and 112 pieces of traffic handled for the month of February. VI left for a vacation in W6-Land. Clubs throughout the section are reminded that Field Day is not too far away and should plan on making a good showing for the section. OIV renewed his OPS appointment. WHV made a good score in the YL Anniversary Party. Traffic: W7BA 1608, DZX 798, QLH 509, APS 193, KZ 172, GYF 169, AMC 121, IST 121, GIP 86, AIB 73, AIA 66, VPW 33, BSW 48, OMO 39, JHS 38, K7CWO 33, ABT 22, W7BTB 20, ZDQ 15, JEV 11, DDQ 3, ITP 3, GSP 2.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—KHU continues to do an FB job as OO and reports gratifying response from notifications sent out. He's also busy chasing DX on 14-Mc. s.s.b. EEF is about to join JBR, ANK, and MAH on RTTY. CUF is working DX with his Elmac barefoot. SKP still is trying to get his kw. going. VIU is awaiting his WAP certificate. The XYL of HOP, in Winnemucca, is now KN7KCY. K7DEE is on the air from Winnemucca with a DX-100. CMI and KHU worked hard in the YL-OM Contest toward YL-WAS. HOP had antenna vs. wind troubles. K7AHA has moved from Elko to Sparks. CWV still is pounding away on TCC with traffic. KN7JW is about ready to take his General Class exam. KN7LFM is a new Novice in Elko; he is the son of KOA and QYL. The NARA held a Valentine Party and continues its Fri. night transmitter hunts. Traffic: (Feb.) W7VIU 99, KHU 37, (Jan.) K7CWV 160.

NEVADA QSO ROUNDUP

May 13-15

In order to assist amateurs everywhere to obtain Nevada contacts for their WAS and/or Nevada Achievement Award, the radio amateurs of the State of Nevada are holding a QSO roundup. This is not a contest, but rather a ganging up on the amateur bands the majority of hams of the state. Follows pertinent information:

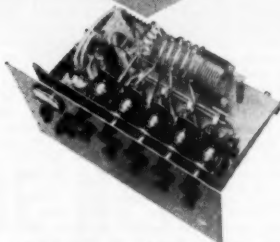
Date: From 1601 PST May 13, 1960 (0001 GMT May 14), to 2400 PST May 15, 1960 (0800 GMT May 16). **Object:** To furnish Nevada contacts to anyone who wants or needs one or more. **Bands:** Eighty through six meters. **Modes:** A1, A3, s.s.b. **QSLs:** All members of the NARA are pledged to QSL 100 per cent, when requested, for contacts during this roundup. If any difficulty is encountered obtaining QSLs, drop a note to C. A. Rhines, W7VIU, SCM Nevada, Box 1025, Elko, Nevada. **Calling:** Nevada stations will call CQ and sign "DE NEVADA W7XXX" on c.w. On phone say: "This is Nevada calling, W7XXX." Stations wishing Nevada contacts call "CQ Nevada" during the roundup.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—SEC: W6ZRJ, PAM: W6ZLO, RM: W6PLG. The Palo Alto Amateur Radio Assn. meets the 1st of the month at 8 p.m. in the Menlo Park Civic Center. Planning an active program are the new officers: W6RLP, pres.; K6GXH, vice-pres.; K6PDI, sec.; W6CGY, treas.; and W6JQE, master at arms. The SCARS held its annual auction Feb. 22. K6JJU is in charge of SCARS Field Day planning. The Pacific Division Convention, (Continued on page 142)

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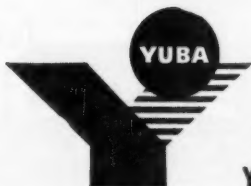
*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

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A completely new design concept in mobile communications—developed for SSB operation. Designed for bumper mounting, this unit puts the RF power directly into a conventional whip antenna. High power Eimac tetrode is used in highly efficient circuit, cooled by small amount of recirculating water. Rated at 1000 watts PEP input with minimum grid drive. Easily interchangeable plug-in units give multi-band operation.

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ROUTE 2. JACKSON, MICHIGAN

sponsored by the CCRC, will be held in our section again this year with Labor Day week end as the target date. W6OWP, W6CQK and K6GZ helped tremendously with the Alaska Fur Rendezvous traffic, clearing much of it on RTTY. Joyce Harrington, K6QCL, was one of the regular operators of K6USA at the 8th Winter Olympics, Squaw Valley. W6ASH has a new 7-ft. console operating position for his multiple transmitter shack. W6CBE has a new home-brew converter and rig on 2 meters. K6GID is working on an ART-13. W6ZJR is rebuilding his BC-610. W6RFF is working on the 20-meter beam. W6RSY is building a GG linear final. W6HRS has a new GPR-90 receiver. W6FON is active in the Post Office Net. W6CLT is the proud father of a new baby boy. Traffic: (Feb.) W6RSY 1085, K6GZ 321, K6ZCR 331, K6DYX 156, W6AIT 149, W6DEF 109, W6HC 109, W6YBV 104, W6FON 71, K6VQK 36, W6YHM 35, W6OII 34, W6ASH 33, W6OWP 31, W6RFF 17, K6YKG 17, W6ZLO 15, W6ZJR 11, W6CLT 2. (Jan.) K6GID 42, W6ZJR 6, K6HFK 1.

EAST BAY—SCM. B. W. Southwell, W6OJW—SEC: K6DQM, EC: W6EFL, K6EDN, K6JNW and K6ESZ. RM: K6ZYX. W6NBX is a new ORS in Berkeley. W6WLI is moving back to the section. KN6KDI was a recent Dixon visitor. The CCRC held its Feb. meeting at the QTH of W6GGC. The ORC's new officers for 1960 are W6YIJ, pres., K6VQF, vice-pres., W6ITN, secy., K6DOQ, treas., and K6YSS, sgt. at arms. K6RMC has a new 40-ft. skyhook. W6BBG is working DX on the low frequencies and is awaiting a new G4U beam. W6ELW took a cruise on the USS *Ranger*. K6JW and K6QAX are on the 144 Mc. K6YSS has a 21-Mc. beam on a new 37-ft. tower. The ORC's station, W6OT, is putting up new antennas, including a five-element, 6-meter beam. K6USA was busy during the Olympics. W6WIQ is QRL college. W6FAR worked K6LTX/MM off the Atlantic Coast, who was using a 1/2-watt c.w. rig. W6OJW is on s.s.b. with a DX-100 and an SB-10. The Solano County emergency frequency is 39.0 kc. K6ZYX has a new HT-37 on s.s.b. A move to start an s.s.b. net in the section and/or Northern California is being made. If interested, contact K6ZYX at 2143 Hillside Avenue, Walnut Creek. That's it for this month. Reports are coming in either late or not at all. Please make an effort to get them in the mail on the first day of each month. Thanks. Traffic: W6NBX 246, K6GK 165, K6ZYX 49.

SAN FRANCISCO—Leonard R. Gerdali, K6ANP—Asst. SCM. Jeri Bey, W6QMO, RM: K6PQG, PAM: W6PZE, EC: K6ERC, W6OPL, W6JWF, OO: W6GQA Class 1, K6OHJ, W6OKR, W6PHS, ORS: W6GGC, W6MXJ, ORS: K6PQG, W6GGC, W6QMO, W6OPL, W6BIP, W6GQY, K6QJB, OFS: W6PZE, W6GGC, W6FEA. The San Francisco Radio Club is making plans for Field Day. W6VYC is Field Day chairman. W6JWF, EC of San Francisco and custodian of W6CXO, reports that the California Chapter of the Red Cross came out tops on the 1959 SET. He takes this opportunity to thank all the amateurs who helped put California on the top of the list. There was not much news this month from the other clubs except that they are busy with plans for Field Day. W6EJY is back on the air on 3995-kc. mobile. W6PCN and W6GCV are contemplating a move to a new QTH down the Peninsula. Both are very active on 20 meters. K6HIW, K6PQG, W6QMO, W6ALK and W6HISF attended the recent California YL get-together in Sacramento. W6PZE is active on ALN and NCTN. W6GQY is very active on RN6, RN7, PAN and TXN. W6GQA reports that he was visited by G6HB, of the United Kingdom Scientific Mission. W6GQA and W6QHS still are tied for consecutive qualifications in the Frequency Measuring Test. They have been in a tie for the last six years. W6ERS, K6ANP and K6HJJ attended the recent DX meeting at the Golden Gate. W6WLD took first place in the February 10-meter transmitter hunt, with K6ANP and K6HYW taking second place. Sorry to hear that W6LTX lost his 60-ft. tower and beam during a wind storm. K6LRN took first place in the mobile field trials. The CCRC voted to sponsor an ARRL Pacific Division Convention in 1960. At this writing the date has been set for the Labor Day week end, Sep. 2, 3 and 4. The location is tentatively set for San Mateo. W6MXJ is sending weekly transmissions on RTTY under the sponsorship of the NCCARTS. Traffic: W6GQY 806, K6QJB 432, W6QMO 370, W6PZE 40, K6PQG 27, W6FEA 13, W6ERS 4.


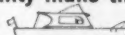
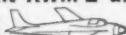
SACRAMENTO VALLEY—SCM. Jon J. O'Brien, W6GDO—Asst. SCM: William van de Kamp, W6CKV, SEC: K6IKV, RM: W6CMA, PAMs: W6SZ and W6PIV. New appointments: K6GFI as OES and K6LYN as OO. The Camellia Capital Chirps put on a very nice YL convention in Sacramento, March 4, 5 and 6. They are pleased with the success of the convention and are to be congratulated on a fine job, well done. K6ENK was gen-

(Continued on page 144)



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HOW TO USE GRID-DIP OSCILLATORS by Rufus P. Turner K6AL. The first book ever devoted entirely to grid-dip oscillators tells you how to construct and use this very versatile instrument with best possible results. Its very many applications are useful to service technicians—radio amateurs—laboratory technicians—students studying electronics and experimenters. It is applicable to all kinds of radio receivers and transmitters, also to television receivers. The grid-dip oscillator is a troubleshooting device—an adjusting device—a frequency measuring device—applicable to circuits and components in circuits—to antennas; also a signal source of variable frequency. #245, \$2.50.

MOON BASE—technical and psychological aspects by Dr. T. C. Helvey, (Principal Biophysical Research Div., Radiation, Inc.) Before the first U.S. team can be sent to the moon, it will be necessary to build on earth a Moon Base prototype (test chamber . . . 70 ft. diameter suggested) to simulate moon environment and reproduce all the stresses under which humans will operate.

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eral chairman, ably assisted by WA6DGH, K6ENL, K6HHD, K6RRH and K6RLR. Highlights of the convention included the Friday evening gathering in the hospitality suite provided by the Hotel El Mirador where the convention was held, the Saturday luncheon for YLs only, the Camellia Show which was a marvelous sight to see with literally thousands of beautiful camellia blossoms and the Saturday evening banquet, which included the OMs who had accompanied their wives to the convention. The OMs had a no-host luncheon on Saturday and were taken on a tour of local TV station KCRA, hosted by W6UAF, the chief engineer. A breakfast gathering on Sunday morning was enjoyed by those who stayed over, and the 2nd Annual California YL Get-together was ended after that. W6PIV has developed a modification for an audio tuning meter for the blind which is accurate to 5 per cent or better; also Ken has worked out a 2-meter antenna for his tree which is impervious to wind and storm. K6SXX plays checkers with K6YBV and is going to learn chess so he can join the chess net. Traffic: K6SXX 633.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—New appointments: K6SGI as EC for Kern County, K6SXX as EC for Stanislaus County. I may be repeating myself, but the Fresno Amateur Radio Club's Annual Banquet is going to be held at the Town & Country Lodge in Fresno May 14, 1960. The ticket price is \$5.50 and this promises to be an excellent affair. The main prize is to be a Drake 2A receiver. The Northern California RTTY gang will be down with their "jingle bells" along with s.s.b., v.h.f., traffic and other talks. Come one and come all. K6IZF has a new HT-32 on 75 meters. K6JGY has moved to Clovis from the Coast. W6FXV has a new Commanche receiver. The Fresno Radio Club still holds radio and theory classes every Mon. at 8 p.m. at the YMCA. K6ZCD is building a new mobile rig for his new Olds. W6JPS blew out one of his ancient 304TL final tubes while tuning up. He claims he has a dozen more somewhere. K6AHQ is on s.s.b. with a 20A and GG 837s. W6TRP is on RTTY. W6JUK is working out on 20-meter s.s.b. with good results. Activities seemed to be a little on the slack side in February.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC. V.H.F. PAM: ACY. From time to time during the past four years I have earnestly requested clubs and amateurs to contribute something to this activity report, but it is very seldom that I get any reports. Twice in four years I have had letters criticising what was included in the section happenings. Each time I have replied to the individual setting forth the job of the SCM and requesting that they send me some information about their club or amateur activity of general interest to amateurs within the section. In neither case have I heard from these individuals again. I might point out that getting a "ticket" or license is an accomplishment but it is not of general interest. Almost every amateur has a call book and notes your call. Working DX is no longer news on the normal ham bands. However, it is news if you work a rare one on 2 or 6 meters. The job of the SCM and SEC is communications; therefore, that is what we try to report. Get the booklet, *Operating an Amateur Station*, from ARRL, and look up the responsibility of the elective officers and those appointed and you will have a better understanding of what ARRL expects from us. I need a good c.w. operator to take the job of Route Manager. Anyone interested, drop me a line. PNM did a good job but had to quit because of other duties. BAW, LEV and FQJ report a total of 2070 messages handled. GXR and BBZ continue to handle their part.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PIE, PAM: K4ILE, RM: K4AVL. The Spartanburg ARC is busy planning for its annual XYL Appreciation Banquet, will be active on 6 meters during the Betsy Rawls' Golf Tourney and is readying for Field Day. A big need is filled in the big phone net by K4KCO, who is now net manager on 3930 kc. K4BFY is back in Columbia and in business. BAW is the new pres. of the Charleston ARC and FTH is editor. NDH is the new editor of *Scarab*. More Red Cross Chapters in South Carolina participated in the SET than in any other state except one. K4JPV and JPX are new amateurs in Camden. The DX RC has a class of 30 Novices at Camden Academy. They are from all over the Southeast. ZRH states that the office of c.d. made awards on Mar. 26 to outstanding amateurs participating in "Eldorado Gracie" operation. A business meeting of the C.W. SCN was held Mar. 13 and a new net manager was elected to succeed K4PIA, who has done an excellent job for the past year. K4VVE has earned his net certificate (Continued on page 148)

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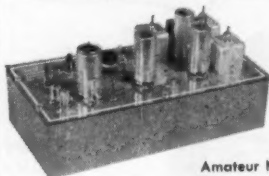
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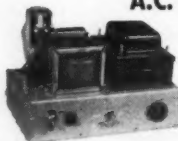


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GAT 69, W4FFH 62, K4ZHV 54, W4DAW 48, K4WCZ 44,
W4AKC 42, CHD 40, PED 33, K4ILE 7, DOF 6, LNJ 5.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—
SEC: K4MJZ, RMs: SHJ, K4JJK, K4QER, K4KNP
and K4EEL. PAMs: BGP and ONV. Section nets: V8N,
1830-1900 on 3680 kc.; VN, 1900 and 2200 on 3680 kc.;
VFN, 1900 on 3835 kc. There is much Norfolk daytime
mobile on the VFN frequency. K4JJK, mgr of VN,
reports 58 sessions with traffic 748, QNI 603, BGP, mgr.
of VFN, reports 29 sessions, traffic 517, QNI 1184, with
72 messages handled at one session! K4QIX says, "Have
missed only one traffic report in about 2 1/2 years." K4-
QER's *Va. Ham Bulletin* is doing a swell job of sup-
plying information to the section. K4JJK is rigging for
RTTY (mostly MARS). CXQ 4 made DXCC/WAC and
got confirmations on DUF-1, 2 and 3 awards, also WBE
and WBCN. K4AJL reports activity on 51.9 Mc. Thanks
for all the nice words on your new SCM! KX, in send-
ing in a traffic report, says, "This is the first one I've
sent in in over 6 years! Almost forgot it." Up Rich-
mond way JJJ reports activity in the Q-C-W-A Party, DX
Tests and the YL-OM Phone Party. K4TUE, Gile Co.
EC, has RTTY and s.s.b. now fired up. Incidentally, are
you an EC or AREC member? It might surprise you
how painless this membership is, and what good you
can do for your community by "joining up." See K4-
MJZ. K4IEUS has a new 66-ft. home-built wood tower
and is using it for 2-meter work. W4LPR reports that
he has been handling traffic with Argentina, and that
the Tidewater Mobile Radio Club is now incorporated.
PK, our OO in Falls Church, had a bang-up month
with 19 violations noted. OOL is taking a "breather"
while he builds and rebuilds. Traffic: (Feb.) K4GFR 794,
KNP 638, W4QDY 428, K4QIX 356, MXF 319, W4SHJ
274, DVT 250, K4MJZ 219, SGQ 183, W4ATQ 149, K4QER
77, JKK 71, W4CXQ 4 65, BZE 54, APM 51, BGP 49,
YVQ 40, K4AKL 31, AL 28, HTP 28, W4J 21,
CWT 20, GOF 12, OWV 12, AAD 8, K4CAD 8, GKX 7,
CHA 6, WALK 6, K4TUE 5, (Jan.) K4SSA 41, W4OOL
37, BGP 19.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM
—SEC: HZA. PAM: K8BIT. RMs: GBF, K8HID, PBO
and VYR. The WVN C.W. Net meets on 3570 kc. at
1900. Phone on 3890 kc. at 1730 and 1830 EST. It is
with regret I report the passing of MCR of Carbon,
John was a former PAM and SCM of W.Va. JDE, work-

WEST VIRGINIA QSO PARTY

May 6-8

The Mountaineer Amateur Radio Association
will sponsor a W. Va. QSO Party from 6:00
P.M. EST May 6 to 11:59 P.M. EST May 8. The
contest is open to all West Virginia amateurs
and to all others who have held calls in W. Va.
in the past. Only these contacts may be counted.
There are no power or band limitations and the
same station may be worked on different bands
for credit. C.w.-to-phone QSOs are allowed but
cross-band contacts are not permitted. Score 2
points for each completed contact, exchanging
the following information and submitting it with
your logs: date; call; time; city, county. When
contacting stations outside of W. Va. obtain
the ex-call of the former W. Va. station. Mo-
biles operating in more than one county may be
worked once in each county by a fixed station,
and the mobile can count the fixed station once
from each county. Each contact with stations
in Morgan-Hardy, Barbour-Doddridge counties
will count 6 points for a complete exchange.
Multiply the final score by the number of coun-
ties worked. Awards for first and second place.
To be eligible, logs must be postmarked not
later than May 25 and mailed to Donald B.
Morris, W8JM, MARA Secretary, Box 909,
Fairmont, W. Va.

ing in Lynchburg, maintains skeds with his father, PNR
in Charleston. CHP has moved to Malden. Winners in
the recent West Va. QSO Party, sponsored by the Ka-
nawha Radio Club, were (c.w.) PBO, K8HID, K8-
AEN; (phone) WHQ, K8JSY and K8HTS. K8AEN has a
new 8B-10. K8JLF made BPL again. K8ARA, K8AVP,
K8JSY, K8MQB and WUB may be found around 3890 kc.
to give you a W.Va. YL contact. NTV sponsors code
and theory classes at Grafton High School. KN90LX
has a new SX-101A and operates around 3720 kc. K8LUS
is very active in GO monitoring. SSA will represent the
East River ARC on the West Va. Hamfest Committee.

(Continued on page 148)

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(See photo on page 127, April QST)

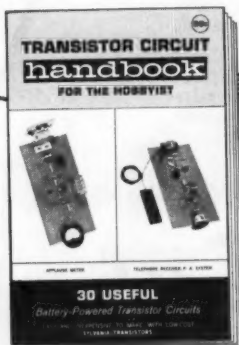
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The West Va. Hamfest will be held at Jackson Mill July 9 and 10, 1960. UHK is active on 75-meter phone in Barbour County for WACWV hunters. Morgan and Doddridge Counties still remain hard to work. Traffic: K8-JLF 520, HID 102, BIT 75, CNB 61, W8ELX 46, K8HTS 28, W8NYH 26, K8GAG 15, GMG 15, AEN 12, CSG 12, W8CCR 10, K8JVP 10, KN8OLX 5, W8DFC 4, KN8PJC 3, K8JSX 2, OEQ 2, W8OIV 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W0BWJ—Asst. SCM; Howard S. Eldridge, K0DCW, SEC; NIT, RMs: EDK and WME. PAMs: CXW and IJR. Attention is called to the appointment of K0DCW as Asst. SCM. Howard will assume duties this summer while BWJ is QRT. K0RTI, at age 11, received appointment as ORS and is believed to be the youngest trafficker to hold regular liaison skeds between section and region level, and to make BPL. James meets HNN, CCW, TWN, PAN and RN5. 7QAP/0 received an OES appointment. The Pikes Peak Radio Amateur Assn. will provide communications for the National Boy Scout Jamboree in Colorado Springs July 22-28. 4TAH/0 is the MARS station at Ft. Carson and reports that the Springs Peak Amateur Radio Club (SPARK) was organized with 22 members. The Abiey High School club station, YOK, is active on HNN and CCW with CLI, 5RNE and KN8 YKQ and YPK. June is Field Day month—challenge another club for the high FD score. Don't forget the annual DRC Hamfest in July. NVU's perfect 3-year QNI record on CWXN ended in February. Congratulations to Poh on a fine record of public service. KQD, ANA, YQ, RTI, QGO and FCC made the BPL. Traffic: (Feb.) W0KQD 573, ANA 507, K0EDH 427, EDK 381, W0EKQ 372, WME 344, YQ 257, K0RTI 235, QGO 159, W4TAH/0 145, W0BWJ 116, K0DXF 102, RBI 95, FCDW 86, PAN 69, W0MYB 68, K0EVG 49, W0CBI 20, DVB 19, IA 16, K0IMJ 10, W0PG 8, K0LCZ 1. (Jan.) K0FCC 514.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM; John H. Sampson, 70CX. The Ogden group now has 2- and 6-meter nets. The 2-meter net meets Wed. at 2000 MST and the 6-meter net Sun. at 1200 MST. EII has completed six months of active duty training and was honor graduate in his radio class. POJ was busy with the DX Contest. Utah is planning a QSO Party for the early fall to help the fellows get that much-needed Utah QSL for WAS. DLW has been active in the Idaho Weather Net each morning and putting the information on the local BC station. This is a public service to aeronautical and motorists. There has been quite a lot of favorable comment. Traffic is holding up quite well. VU2MD, in India, needs Utah for WAS. He is on daily beginning at 1600 GMT on 14.05 Mc. Send your reports to the SCM on the 1st of each month. Traffic: W7OCX 359, W3MDL/7 43, K7HIO 35, W7QWH 17, K7CUE 9.

NEW MEXICO—SCM, Newell F. Greene, K51QL—Asst. SCM: Carl W. Franz, 5ZHN, SEC: CIN, PAM: ZU. V.H.F. PAM: FBP. The New Mexico Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. The New Mexico Emergency Phone Net meets Sun. at 0730 MST, Tue. and Thurs. at 1800 MST on 3838 kc. The BPN meets on Mon., Wed. and Fri. on 3570 kc. at 2000 MST. The TWN meets daily on 3570 kc. at 1900. Echo Charley Net meets at 1900 Sun. on 3980 kc. The Artesia ARC held a successful SET Feb. 21, operating 5BWV/3 on emergency power. Plans are shaping up for the State Picnic this summer. Keep baskets ready and the NYL tower and the Hornet hot and spinning on top. The Albuquerque 6-Meter net blossomed on 50.2 Mc. Mon. at 1900 MST. The 2-Meter Net held 3 sessions with a total of 43. Traffic: W5ZHN 554, K5LMJ 94, GOJ 90, IPK 81, W5UBW/3 67, K5DAB 32, W5YSJ 47, CV 25, GB 10, K5DAA 9, LWN 6, PAT 2, W5ZU 2.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sat. at 0800 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The Wyoming Hamfest dates are July 16 and 17, 1960. The location to be decided. Traffic: W7DXV 85, BHH 71, AXG 62, YWW 26, K7KLE 21, W7COL 7, AMU 6, K7IAY 3, W7MHW 3, ABO 2, DTD 2, K7AHO 1, CRL 1, W7GLQ 1, K7HHW 1, IOH 1, W7TZK 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—Asst. SCM: O.K. Gibbs, K4BTO, SEC: JDA. RMs: RLG and OCV. PAMs: PHH, BTO and JJX. New appointments: V.H.F. PAM: JJX; V.H.F. RM: K4OCV; OOs: K4SSB, HAL and MNO; OPs: SAV, ECs: K4HJM and

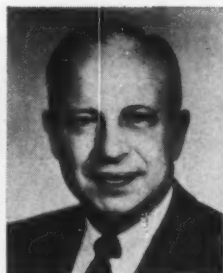
(Continued on page 150)



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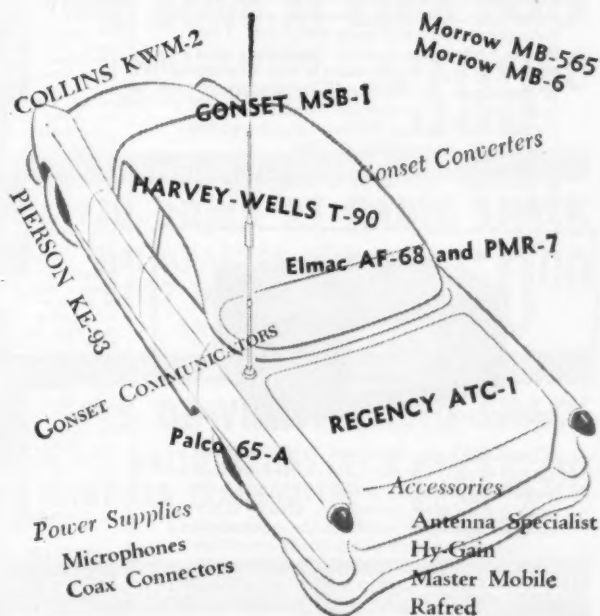
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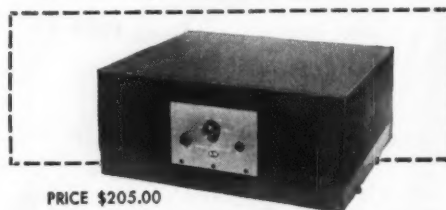


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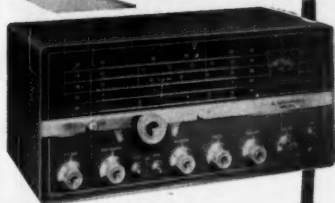
JGQ. Welcome to the Haleyville Amateur Radio Club, just organized with K4XS, pres., NBG/4, vice-pres., K4FTC, secy. The new net mgr. of AENX is K4KQD. EFF, K4MBM and VZU have double sideband on 6 meters. CIN has stacked five element beams plus a ground plane on 6 meters. The Birmingham Amateur Radio Club is sponsoring a building project to put 25 to 50 6-meter mobiles on the air. If interested, contact DFE. HOB holds 50-Mc. WAS AZC has 48 states on 50 Mc. K4CZK has a BW-5100 and an NC-109 and is a new member of AENT. A new ham in Evergreen is K4NTH. CZK worked KH6DHI on 75 meters with 120 watts. We welcome PTR to AENB. K4SAV was 100 per cent on AENB in Feb.; Alabama was 100 per cent on RN5 in Jan. Congrats to the three highest QNI on AENB in 1959: RLG 311, KIX 251, K4SSB 249. K4RJM has CP-25. YRO now is in Montgomery. Florence's loss is Montgomery's gain. K4CRA dropped the "N." There are now 85 hams in the Tri Cities. The Muscle Shoals ARC is conducting code classes. Traffic: W4RLG 291, K4PFM 259, SAV 153, DJJ 98, UEE 94, RJM 62, W4KIX 60, K4AOZ 53, JDA 51, RIL 51, PHH 43, W4OKQ 42, MI 41, K4SSB 35, BTO 34, HVN 32, W4CIU 29, USM 26, K4UGR 22, JGQ 19, W4WHW 17, K4TNS 12, HFX 11, IPF 10, KJD 10, W4PTR 7, K4JSP 6, CZK 5, W4CEF 4, K4HAL 4, W4EVU 3, RTQ 3, K4RIX 1.

EASTERN FLORIDA—SCM, John F. Porter, W4RGJ—SEC: IYT, RM: K4SJM, PAM: TAS, V.H.F. PAM: RMU. New officers of the Miami Springs RC K4GGX, pres.; SA, vice-pres.; K4YST, secy-treas. The Hialeah RC's new call is MRC. K4LZL, K4LZL activated Feb. 25 in the northeastern part of our State because of the tornado alert. UHC, QCP and many others took part. Polk County AREC provided communications for the Heart Fund Drive, using 2-meter mobiles. DPD reports lots of publicity on the local radio station during this event. Propagation Unlimited is now affiliated with ARRL. The Orlando ARC publishes a monthly club bulletin called *Listening Post*. The editor is K4LZL. Other clubs known to have bulletins are the Broward ARC, Winter Haven RC, Ft. Myers RC, Daytona Beach ARC, St. Pete RC and the W. Palm Beach RC. Your SCM would appreciate being placed on the mailing list for any others. The Suncoast V.H.F. Club now has a permanent meeting place, the C.D. Hq. The Sunshine State Novice Net now meets on 7100 kc. For details contact K4FMA. New officers of the South Miami RC are K4KEG, pres.; K4ITB, vice-pres.; K4YST, secy.; UWP, treas.; K4UO, sta. eng. New officers of the Fla. RTTY Society are WMN, pres.; IET, vice-pres.; RWM, secy-treas.; RTJ, QR, K4PMF, K4QKA and K4OFG, board of directors. RTTY is picking up in Florida. For more information write P.O. Box 6047, Daytona Beach, Fla. We were sorry to hear of the passing of PZT. Ulmer held EC, ORS and OPS appointments. Fellows, how about trying to get your traffic reports and news in the mail by at least the 3rd of each month? Nine made, BPL in February. Our AREC total is up to 1069 now. Let's make it 1500. Traffic: (Feb.) W4FPC 2074, K4-QLG 795, SJH 650, FMA 539, EHY 511, ODN 418, LCD 355, KDN 324, BY 271, W4SDR 270, K4ILB 268, K4LCF 203, GBS 191, W4LMT 150, K4AX 124, K4LDF 104, W4FE 100, GJI 94, K4RNS 56, SLR 54, W4IYT 35, BKC 31, K4TDT 31, AHW 28, BLM 23, W4SGY 22, K4AZM 19, W4SMK 17, K4BOO 13, FXG 13, W4IOC 10, K4MTP 10, JJZ 9, OSQ 5, W4LHU 4. (Jan.) K4FXG 29, K4LDF 20, W4JTA 12, TRS 8, LSA 5.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: HKK, PAM: RZF, RM: XAP and UBR. Perry: KQP has several Novices about ready for Conditional Class. Chipley: LXX has been appointed Asst. EC. He is active on 40 meters with a Globe King, IKB, Washington Co. EC, finally got on 75 meters and checks into the W. Fla. Phone Net. K4CNY is a new ham in Vernon. Port St. Joe: The Gulf Missile Range has brought several new hams to the area, among them K5ISQ, HZI, K4LQE, K8MOG, K4MXW, ZKP, HWA and K5CJU. Gulf Co. EC K4RZM has taken all lined up to join AREC. Panama City: K4CNY has moved here from Tennessee and will be a big help in the Fla. C.W. Net. The PCAEC, headed by K4QVY, is planning a big Gulf Coast Hamfest June 18-19, at Eglin AFB: K4UBR, RM and QFN net mgr., is moving to a new QTH and will be QRT for a while. ATA will replace him. QFN will continue to operate through the summer on 3650 kc. Give it your support. Pensacola: The PARC and the V.H.F. Club joined to set up a fine booth at the USQ Hobby Show. SRK, PQW, IVD, EWG, OOW, PIQ, DDD, SWQ, SOI, LQC, BET and RMO were active on the Feb. Sports Car Rally. K4BSS is serving as liaison between the C.W. Net, and the W. Fla. Phone Net. HIZ, PQW and HKK gave talks on AREC and c.d. at the last PARC meeting. Traffic: K4UBR 408, CNY/4 201, BSS 59.

(Continued on page 152)

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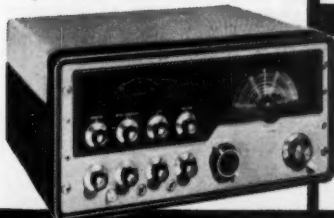
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GEORGIA—SCM. William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 0800 on Sun., GSN Mon. through Sun. at 1900 EST on 3593 kc., DDY as NC. GTAN Sat. at 1000 EST on 7293 kc. 75-meter Mobile Phone Net each Sun. at 1330 EST on 3995 kc., K4JTC as NC: ATL Ten-Meter Phone Net each Sun. at 220 EST on 29.6 Mc. KWC as NC: GPYL Net each Thurs. on 7260 kc. at 0900 EST, K4DNL as NC: GAN on 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. The flu bug hit many of our members of different nets and therefore held down participation. K4MIH made BPL for the third straight month. LNC still is in Florida. K4PYM reports the club had the film on Solar Battery shown to them during the month of Feb. Many hams operated around the clock during the recent bad ice storm in Georgia. Among those who devoted many hours were K4AFP, UUH, YEK, TJS, IMQ, DX/14, IU, K4CLO, K4QQY, K4CCJ, K4CWS, K4CGT, K4YID, K4TMM, MV, BLI, BPW, K4ZKT, M, K4PGJ, GJZ, K4AVK, BAR, FIZ, K4BAI, K4ZZS, W4ZOP, K4VIE, W4IGC, MZO, K4UE, VX, FYC, K4LEH, K4BFN, POI, operating K4UCJ, ZUF and PBK. On Mar. 7 another snow storm hit Georgia and many of these were back at it again furnishing communication. These hams were members of Ga. RACES and AREC. Air Force and Army MAERS. Georgia Cracker Emergency Net and GSN did a splendid job on 3593 kc. handling emergency traffic. Many QMs got cold suppers while their XYLs handled emergency traffic. Traffic: W4ZRU 625, K4EJI 305, BQP 264, WADDY 240, K4BAI 148, VHC 136, PYM 134, MIH 116, LVE 45, BVD 33, DLB 19, BYK 5, W4ZTJ 5.

WEST INDIES—SCM. William Werner, KP4DJ—SEC: AAA. API received an OPS appointment and reports his amateur radio display at his school's Science Fair was a great success. KD worked 31 QCWA stations and 31 YLs in the YL-OM Contest. KD made 476 contacts in 47 states in nine hours of brasspounding in the DX Contest. CC made over a thousand contacts in the C.W. DX Contest. KD received QSLs from Z8TDA, Z86IF/8 and LAING P, and a certificate from the Southeast DX Club of Atlanta, Ga. AOO and ATM both moved to the Los Angeles Development near the airport. AOO has his Mosley Tribander up, while ATM is building a tower for his beam. LX, ex-police radio now with Federal Aviation Agency, is working with KD. W2AIS and his XYL were in San Juan on the way to St. Thomas honeymoon. AIS is tape-recording amateur interviews for VOA. AAN is on 50 Mc. with a new Viking Thunderbolt. AQQ's acquisition of a General Class ticket prompted celebration by forty 6-meter friends at AAN's QTH. AQQ uses a HiBander on 6 meters and just built an Apache and an SB-10 for use on the lower frequencies with a vertical antenna. ALY is the new owner of RM's Globe King, and WLU will warm up RM's Apache and Mohawk while RM is building a new home. AMG is very happy with his new Globe Scout Deluxe on 6 meters. LK added a BC-453 Q5-er to the HRO. YL APX was active on 10 meters during the YL-OM Contest. ALY modified ATZ's Challenger with 12-ohm cathode resistor in the final to limit plate current in the "standby" position. S.S.B.-or RC also works 15-meter c.w. ASN has a new Tecraft CC50 6-meter converter and five-element beam. The PRARC's Annual Hamfest and election of officers was held Mar. 20 at the Colegio San Jose in Rio Piedras, NY is the school's club call; AOD and AOF are teachers there.

CANAL ZONE—SCM. Ralph E. Harvey, KZ5RV—The Civil Defense station at Balboa Heights, BH, has received some new equipment, a Viking Valiant transmitter and an NC-503 receiver. This equipment has been checked out on the new Triband beam and has been getting S-9 reports from various parts of the States. The members of the Crossroads Amateur Radio Club have spent quite a bit of time renovating their new home and deserve a big hand for their efforts. The licensing authority at Quarry Heights has announced that in line with the additional 50 kc. on the 20-meter band recently granted by FCC, the Canal Zone amateurs are permitted like operation effective Apr. 1, 1960. RM again is going to the States on business, this time to Chicago. RM will be back in California in July. Rumor has it that CT had a c.e. of nuns. New hams: FG and GM. Traffic: KZ5OA 97, OB 86, SW 78, AD 60, VF 36, JL 24, LL 21, HQ 18, MM 18, UR 18, CE 12, CC 2, VR 1.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM. Albert F. Hill, Jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6BUK and W6ORS. The following stations earned BPL for the month of February: K6PXQ, W6GYH, K6WAH, K6LYR, K6HLR, K6MCA, W6ZJB, K6EA and W6EEO. Congrats, fellows! W6GYH handled traffic for the

(Continued on page 154)

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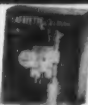
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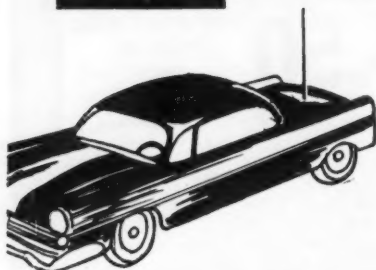
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Price	15.90				18.75		

Special 40 & 80 meter bumper mount antennas
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Amateur net



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Alaskan Fur Rendezvous. Nice going, Cavi! K6WAH is putting on a kw. with 250THs. W6ZJB put up a new 20-meter Telrex beam. K6PLW is on crutches after a traffic accident. We all wish you a speedy recovery, John. W6IBD has a new transistorized 1-Mc. oscillator. W6NAA would appreciate information on 430-Mc. ham-TV. W6AGCM has received his General Class license! K6PSP put on the 4-250A final at 1 kw. W6AYF has a Circle quad working fine. K6COP put in forced-air cooling and it works fine! W6SRE is hitting the road to the north regularly. W6CKR is keeping schedules with her brother, who is W6IILU. K6CLS/6 is sporting a nice Plymouth and an RN6 certificate. Congrats, Jerry! W6AM is using a Johnson Pacemaker and a Thunderbolt on s.s.b. W6OIV is working some fine DX. W6COQ and W6RFX are having a big time on 2 meters. K6GLS is taking a new job. Best wishes, Tony! K6LTO was busy monitoring the DX Test. W6FB got up a new trap antenna. W6ORS still is working hard on the 420-Mc. gear. W6SFX is on s.s.b. with a GSB-100, as is W6BXZ. Support your section nets: On c.w., the Southern California Net, which meets at 1900 PST daily on 3600 kc.; on phone, the SoCal 6 Net, which meets at 1900 Pst on 50.4 and 51.0 Mc. daily. Traffic: (Feb.) K6PXQ 1023, W6GYH 1015, K6LVR 945, K6WAH 945, K6HLR 883, K6MCA 884, W6ZJB 701, W6WPF 470, K6EA 464, W6DJB 336, K6OZJ 335, W6CKR 315, K6CLS/6 282, W6BHG 250, W6EEO 197, K6PSP 107, K6JSD 89, K6KIU 26, W6ADWP 21, K6SIX 18, W6USY 18, W6CIS 14, W6BUK 13, W6DHI 13, K6PLW 11, K6COP 10, W6GCCM 9, K6CDW 8, W6AYF 6, W6OIV 6, W6SRE 6. (Jan.) W9OWZ/6 2.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: CAF, PAM CSN 3880 kc.; FMZ, The Tucson AREC Net, on 3880 kc., now has 21 check-ins. Phoenix Area clubs held a joint meeting at Scottsdale with about 225 present to see a demonstration of antennas by Hy-Gain. The AAR Club provided communications for a sports car race at the fairgrounds. MDD, OAS, and NGJ are on s.s.b. Traffic: W7AMM 40, DRI 35, K7CET 27, W7OIF 20, CAF 6.

SAN DIEGO—SCM, Don Stansifer, W6LRU—New Novices in Escondido are W6KBJ and W6KLB. W6LEY, in La Mesa, is active on 6 and 2 meters and 220 Mc. The Escondido High School Radio Club, W6IAC, is now active on 40-meter phone with a 20-watt rig. K6BX, a DXer in Bonita, was responsible for 76 call books being sent to DXers overseas during February. He also now has a Telrex TM-30 Tribander. K6BTO is converting an APX-6 for use on 1296 Mc. and continues to look for crossband contacts on 2 and 6 meters. The El Cajon Valley High School, W6DJS, sent in another traffic report for February. W6CDD, of El Cajon, has made BPL for the third month in a row with over 100 originated messages each month. Our SEC, W6LYF, with K6JPI, San Diego City Radio Office, visited the Palomar Radio Club meeting in February. W6LYF sent in a yearly report on emergency activities in the section which notes that Orange and Imperial Counties (both in this ARRL section) have no Emergency Coordinators appointed to date. Your SCM, as well as the SEC, is open to suggestions. The March meeting of the Newport Amateur Radio Society was a joint meeting with the Orange County and the Fullerton Clubs held in Santa Ana. A film, "S.S. Nautilus," was shown and our Director, W6MLZ, was guest of honor. Traffic: (Feb.) W6YDK 1629, W6EOT 882, K6BPI 571, W6CDD 244, W6ATB 174, W6DJS 59, K6LKD 46. (Jan.) W6YDK 1130.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—W6MSG is pres. of the Paso Robles Radio Club. The club has started a 160-meter net for local get-togethers on the Tue. that are not regular meeting nights, for some on-the-air activity. The York Mountain Boys Club elected new officers as follows: K6TIB, pres.; K6DGI, vice-pres.; W6EDB, secy.-treas. The EC for the Atascadero Area is K6RFK. W6BLM reports a slow month for traffic. The Ventura County Club has its roster out. The club joined the L.A. Area Council of Radio Clubs when it met for the first time this year. The Poinsettia Radio Club elected K6RWP, pres.; W6LQJ, vice-pres.; W6EZA, secy.; K6RYB, treas. W6IAV and his XYL are expecting a new harmonic. A new OO and ORS, K5TQW/6, has a 75A-4 receiver, a BW-5100B transmitter and a ground-plane antenna. Traffic: W6BLM 226, W6FYW 5.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W3BNG —Asst. SCM: E. C. Pool, 5NF0. SEC: K5AEX. PAM: BOO, RM: K5ETX. The recently-formed Mineral Wells ARC now has 23 members and has received notification of ARRL affiliation. The club has a code and theory class going each Thurs. night. Ten of the club members be-

(Continued on page 156)



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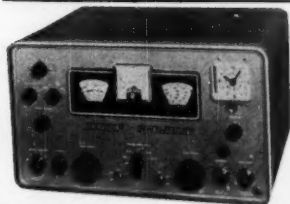
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Clock **\$10**
Speaker **\$14.95**



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Field Strength - Modulation Meter

Tests power-output, frequency, audio level, modulation, distortion, hum, percent modulation and harmonic content of transmitter.

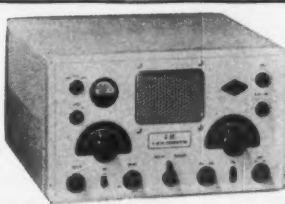
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- Self-powered; standard batteries
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Gonset 6 Meter Communicator	175.00
WRL 755 VFO	44.95
Johnson Viking Mobile	75.00
WRL Scout 65	45.00
Heath DX-35	44.95
Central Electronics 600L	395.00
Johnson Viking II (New)	275.00
Gonset Tuner 30-40 mc FM	44.95
Collins 32V-3 Hallicrafters S-40B	495.00
Hallicrafters S-76	74.95
Central Electronics SB Slicer; Q Multi	99.50
Gonset Tuner 40-50 mc FM	75.00
National HRC-50T W/Spkr - 8 coils	39.50
Technical Materials GPR-90. W/Spkr	375.00
RME 10 - 20 Hallicrafters SX-71	49.50
National HFS W/Power Supply	129.50
National SW-54	149.50
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Hallicrafters S-85	119.50
Hallicrafters SX-99	95.00
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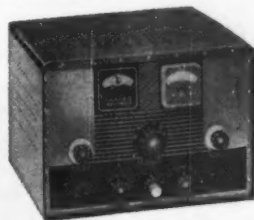


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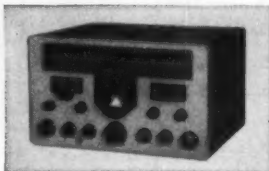
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see page 119

PRIEST ELECTRONICS

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long to the RACES group of Palo Pinto County. Congratulations to K5QOV, president of the club and spark plug for all the activity. NFO says he has nothing to report from West Texas this time but be sure and watch for announcements of coming hamfests. Abilene will have one May 1. K5TMR is a judge in Brownwood and has an FB c.d. set-up. K5AEX is sending a letter to all ECs in his file, requesting information. When you receive yours please answer it promptly. GY needs an outlet for Old Mexico traffic. Looks like the month of February was short of news as well as days. Now is the time for you to start thinking about Field Day, the Convention, S.E.T. and other activities for which you will need to prepare. Please note the election notice that appears in April QST and exercise your privilege as a member of the League, nominating and voting for the amateur of your choice as a League Official. Traffic: K5LZW 674, W5BKH 558, GY 329, K5LGI 158, W5BOO 147, K5PXV 111, IBB 92, W5PTL 92, K5RAV 43, ACD 35, W5LR 25, KYM 6.

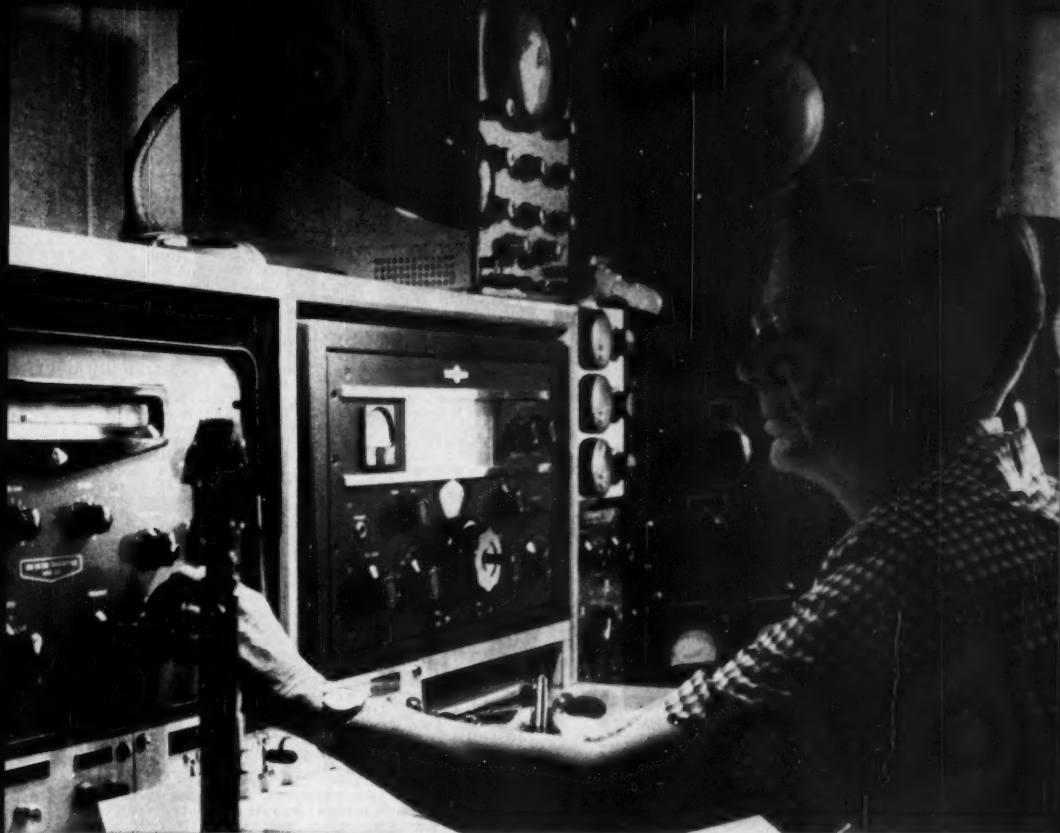
OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—VCJ, PAM 6 meters, and HXK, PAM 2 meters, would like to see more fellows on 6 and 2 meters. A new club has been formed at Calumet with K5RLM, pres.; K5REB, vice pres.; K5GDE, secy.-treas. DBA is the new pres. of the Sand Springs Club and TVU is secy.-treas. Bartlesville now is holding its annual Novice Class school with 26 enrolled. Oklahoma has another Silent Key, HFX, who passed away Feb. 27. VNC is home and on the air again after two years in England. The Lawton-Ft. Sill Hamfest was one of the best with 199 registered. FEC, former SCM, is the proud owner of a brand-new hamshack. Judging by the program calendar the Muskogee Club must have some mighty interesting meetings. Apologies to the Chisholm Trail Club. We erroneously gave the name of the club paper as *Chit-Chat* instead of *Rag-chew*. K5REH has a new Apache. Two new signals are coming out of Okmulgee, KN5ZHT and KN5ZUB. Novices in Tulsa are starting a net on 7156 kc. at 11:30 a.m. each Sat. The Tulsa Mobile and Northfolk Clubs both are sponsoring their annual hamfest this spring. Traffic: K5USA 511, CAY 338, JGZ 254, BAY 246, W5VVQ 219, DRZ 210, QMJ 139, EJK 133, UYQ 79, OOF 62, K5AUX 54, W5FEC 53, K5DLP 46, OJD 46, ELG 37, W5KY 36, K5QEF 33, JOA 25, LYM 21, W5MFX 21, K5OVR 21, W5WAF 20, VLW 18, CCK 17, K5OOV 15, REH 14, IBZ 12, OTM 11, W5WDD 11, K5BNQ 10, W5CJV 9, GIQ 8, K5INC 7, BFW 5, W5MQI 4, K5QAK 4, EZM 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC, KQF. The new officers of the Corpus Christi Radio Club are K5EWK, pres.; INN, vice-pres.; K5WQF, secy.; K5GGB, treas.; GMT, act. dir.; HQR, publicity. New directors are APT and K5LJI. New calls in Corpus Christi are KN5ZEY and KN5ZKZ. K5TAA has dropped the "N" from his call. GMT visited with the club at Bellville and came back with some attendance reports that should make some of the clubs in our larger towns ashamed. The amateurs of Eagle Pass have organized the El Aguila Radio Club with 9 full and 9 associate members. All 9 full members are members of ARRL. Officers are K5OFR, pres.; K5SKO, vice-pres.; RKL, secy.-treas. Two of the members are XE2NZ and XE2DS from Rosita, Coahuila, Mexico. The club is starting code and theory classes. K5OFS has a new GSB-100 and contacted a KC4 in Antarctica the first night. I understand the old radio gear museum of the Houston Amateur Radio Club is second to none. I am looking forward to seeing it on my next visit to Houston. The permanent officers of the Hy-Banders Club in Houston are ID, pres.; K5SAX, vice-pres.; K5YIA, secy.-treas.; TGG, technical adviser; and BUG, program chairman. The 7220 Traffic Net had 43 sessions, 1377 check-ins and 937 messages handled. How about some traffic reports? Congratulations to K5MXO on making BPL. New net certificate holders are K5MXO, K5ALF and BHO. It is time to begin making plans for the West Gulf Convention in Dallas in June. Traffic: K5MXO 196, W5BHO 120, AC 93, ZPD 56, K5WIC 30.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC and H. C. Hillyard, VO1CZ. SEC: BL. New appointments include W9QNI/VOZ as an OPS. Winner in the VE1 Contest was a VE1GA with a score of 7560, while runners-up were XP and AV. WL has returned from a three-week stay in England where he visited G3LU, G3AAM and other amateurs. GC has a new Cheyenne transmitter. Amateur TV has made its debut in the section! More details when they become available. CL has received his OT certificate (active since 1931). VO2AW has received his CP-25 certificate. Members of the St. Croix Valley Club recently put on a test emergency drill for members of the St. Andrews

(Continued on page 158)



ED DODGE, W1CMU—ham and former Raytheon field engineer.

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Modulates transmitters having RF inputs up
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Kiwanis Club. Those participating were ER, LT, CL, DP and ACJ. VA was elected to the Town Council at Hartland. ADH is working on a 500-watt linear amplifier. ES expects to have the DX-40 in operation soon. Sincere thanks to those of you who have contributed to this column by your consistent reporting. The writer would appreciate your continued support during his next term of office. Traffic: VE1ADH 62, OM 26, DB 15, ES 2.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The Nottown ARC was active at the Sportsman Show in Toronto. Over 300 messages were handled. BWK is in Winnipeg. CFK is heading towards VE4- or VE5-Land. DQL, pres. of the Norquebont Club, advises that this group is up and at it again. DEE is DXing on 10 meters. AGH and BTP were guests at the Air Cadet meeting in the Niagara Area. BTI has a D.O.T. General Class certificate. If you have not done so *renew your license now*. The London gang is hot on the LARC Award. Most of the members are on each night. Ten QSL cards get you your certificate. CFR, CUG and DRG were on TV recently. CFR and his XYL visited W4-Land. DGW and DYK were speakers at the Algoma ARC recently. The topic was s.s.b. W8FYX also was a guest speaker there. KM is en route to Florida. DTO is back in VE6-Land for a visit. DXZ is DXing on 10 meters. The Hamilton Club is getting ready for Field Day. CUM was a visitor to Rome, Italy. From Sarnia we hear that CZE is on c.w., CXF is DXing. DYE lost his beam. North Bay had a fine meeting, many of the RCAF boys at the Air Station took in the meeting. EAW attended the S.S.B. Dinner in Oakville. This was the first one to be held in Ontario. Your SCM and SEC were present and had a wonderful time. MR presented slides of his DX-pedition to the Dutch Indies. Sarnia reports that K8BDJ is pres., K8IEK, vice-pres., KN8OZE, secy-treas., and DFU; rec. secy. DDL is s.s.b. DFU is editor of the club paper. Ottawa advises of a new certificate, W.O.M. (Worked Ottawa Mobiles). Work five of them and get the QSLs, mail with a self-addressed and stamped cover to the secretary, DY, 280 Flora St., Ottawa, Ont. DXT is in the hospital. Traffic: (Feb.) VE3BUR 332, DPO HAM NG 102, BZB 93, DXCN 78, NO 71, TM 64, AL 63, EAM 42, RN 33, CFR 26, DWN 16, EHL 14, AML 11, GO 11, KM 10, AMZ 7, VD 3 (Jan.) VE3DH 19. (Dec.) VE3BUR 394, BZB 168, EAR 39.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Please support your traffic nets: OQN (slow-speed c.w.) on 3535 kc, daily at 1900, and Quebec Phone Net on 3780 kc, daily at 1845. WY finds his QTH excellent for exotic DX on 10-meter phone and has worked 120 to date. QA is a proud father again, a daughter (6th harmonic). ABE is planning a trip to FPS-Land again in July and hopes to operate from the island of Miquelon, possibly with an EP7 and FP6 call. It will be emergency power as there is no regular power supply on this island. OJ finally made it up on 80 meters. WW probably came in second in the BERU fray. BB enjoyed the Florida sunshine and may be back on the air shortly. NV actually was heard on c.w. AIO hears many VE2s on 36 Mc. Congrats to WA2CNS VE8, who has earned a medalion for making the BPL three times. EC reports that the St. Maurice Valley gang is very active on 144 Mc. AOL has an all-transistorized all-band receiver. Despite success with a horizontal trap antenna, JE is investigating cubical quad. It is rumored that 3UY, an ardent member of the local 73-meter phone gang, will be bringing back a Swedish parakeet from Florida for DR. IC is perfecting his "gidget" which is supposed to give an answer to all antenna problems. K2VTX/VE2 reports signs of BBC TV sigs on 49 Mc. He is working on a 32-element beam for 2 meters. DU is now living in New York City and hopes to be on from there in the near future. Traffic: VE2WT 522, WA2CNS/VE8 214, VE2DR 169, EC 40, AGN 31.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Thanks again to both Nanaimo and Victoria for forwarding their respective ham news sheet. AK still hasn't got his house built but the ham shack is built. The Nanaimo Club will be invading 6 meters by all reports. The Victoria Club, with MT doing the work, is getting out a Vancouver Island phone directory. The M.P. from Peace River, who is a ham, spoke out for amateur license plates. For forty days BAF has tried five rigs and his antennas have tried the neighbors. AQD is having a ball with one watt. AMT reports using a CR3AC Philmore receiver. BCEN, on 3630 kc, had 50 sessions with a total of 399 check-ins and handled 275 pieces of traffic. AOT is the net manager. Upper coast stations in Prince Rupert and Westview as well as some Alaskan stations and Kamloops have shown interest in the BCEN. The speed has been out to 20 w.p.m. and the NC8s will QR to any speed requested. The early sessions are on the move and the newcomers are invited to get their feet wet at 1900 on 3650 kc. The net manager has had correspondence from VE4 re a trancon traffic net. Maybe

(Continued on page 160)

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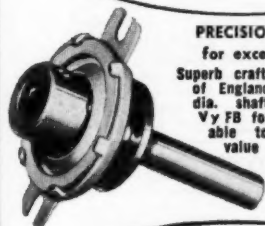
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1 1/2" square 0-500 microamperes. Bakelite case. By Dejur.
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1 1/2" square (ruggedized) 0-100 microamps.
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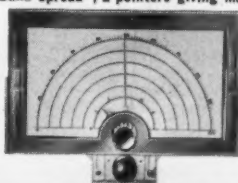
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Ratios: Main 6:1, Band Spread 48:1. Supplied with black escutcheon and glass; fitted degree scale allows for dial calibration.

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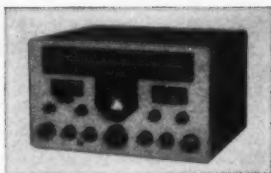
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see page 119

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something will develop. MG should have his Apache. AEC fixed his receiver; now the power line noise and broadcast harmonics have fixed it good. TP and EX are going great guns on RTTY. How about an RTTY net? Traffic: VE7AAF 289, JQ 148, AOT 105, AQD 26, AEC 25, AMT 12, BDC 1.

MANITOBA—SCM, M. S. Watson, VE4JY—The Brandon ARC will hold a hamfest on Sept. 3 and 4, 1960, at Brandon. The club's smart publication, *Spark* (editor Fran Hadron, KN), is in its eleventh year. The ARLM's *Satellite* is increasing in popularity with LJ, editor, and TJ, pres., at the helm. TT, popular 20-meter operator, is now treas. of the club. WS gave an exciting report illustrated by slides on his trip to VK- and ZL-Land at the January meeting. The Flin Flon ARC elected HH, pres., and TK, secy., for 1960. UM, the University of Manitoba club station, is active again with a good signal. AI is on the air after a long absence with a new Apache transmitter. The northern section of the Manitoba ARRL Phone Net, which meets just prior to the regular net and reports in to the southern section at 1900 daily, has speeded up the net business. Thanks to former SCM for a job well done. Traffic: VE4SL 55, JY 12, PE 8, QD 6, EH 5, HS 4, IW 4, RB 4, XP 3, AN 2, GB 2, PW 2, RR 2.

SASKATCHEWAN—SCM, H. R. Horn, VESHR—JV has 200 countries confirmed. RS, whose new QTH is Indian Head, reports he visited an amateur club in Mexico but little English was spoken. Ex-3BUA now is located at Moose Jaw. SY is working on a five-band vertical. MR and IR now are mobile. OP makes good use of the DX-40 the VE gang gave him for his valued work as QSL Manager. TK and JV are on s.s.b. and d.s.b. TK gave an excellent s.s.b. talk to the MJARC. HX and AI mobilized a cavalcade of cars to the Big Squaw Rapids Dam powerhouse in Northern Saskatchewan. AM and NQ passed their Advanced Amateur exams. EQ advises there are five active hams now in Estevan. XX has a new 73A-4. EV a new 101-A. AT has built a new rig with a 6146 final. AI and IL are back on 75 meters after a long absence. GO keeps 14-Mc. skeds daily with 3GS, VB, XX and GT were among those at the Broadcast Engineers Convention at Saskatoon. QC has a new car and new Heath mobile gear. He also reports the Husettes, XYLs of Saskatoon hams, are doing good work in helping to raise funds for local projects. They serve lunch at meetings held the same night as the QMs, and charge a small fee. Traffic: VE4DS 21, QL 12, EQ 8, HQ 8, IG 5, HF 4, NR 4, EO 3, BF 2, CB 2, CR 2, DC 2, GO 2, HX 2, IL 2, PD 2, PQ 2, TM 2, FO 1.

QST

How's DX?

(Continued from page 85)

finally poured the foundation for our new building here. Next month we start construction of the necessary antennas, arrangement of gear and rotator installation. More than likely it will be a few months before all is completed, but we may be on the air before then. SV0WT is active only on 20 meters at present but we plan for 10 and 15 in the future. . . . We cannot transmit s.s.b. yet (no gear) and I would like to try sideband here under my own call, SV0WY. Jim is due home on quota this December but has filed for a six-month tour extension. . . . Ex-OE1KR, now happily WA2KMY, closed out his Austrian DX career at 128/99. After years awaiting the U. S. citizenship necessary for W/K status, Henry notes few changes in the DX milieu. "DX stations still rate T9 reports for T6 signals, and U. S. Twos are on the bottom of the preferred prefix list, as usual." [Aw, nobody's lower than Nines, Boss—he must be kidding!—Jeeves] . . . SM5WJ alerts K6BX: "This summer I hope to take my rig with me for SM1 work when I go to Gotland." . . . K6BX also relays data from SP5HS and the PZK group concerning the Millennium Award, a certification available to all DX hounds who confirm contacts with two stations in each of Poland's nine call areas in the period 1960-66. This promotion coincides with festivities celebrating the thousand-year history of Poland. By the same token, there may be a PZK-sponsored international DX contest this fall. . . . K6OYD says IS1FIC desires specs info and/or schematics for his Bendix RA1B-24 200-watt rig. . . . K3CUI and W8FAZ chorus U.S.S.R. amateur allocations as of early 1960 (Mc.): 3.5-3.65, c.w. and a.m.; 7-7.1, the same; 14-14.1, c.w.; 14.1-14.3, a.m.; 14.3-14.35, s.s.b.; 21-21.15, c.w.; 21.15-21.35, a.m.; 21.35-21.45, s.s.b.; 28-28.2, a.m.; 28.2-28.5, a.m.; 28.5-29.7 s.s.b.(f); 144-146, c.w. and a.m.; and 420-435, likewise. . . . From W7HNT and Yank friends stationed in Spain: Any DXer who confirms QSOs with 20 stations in the Spanish province of Sevilla after April 1, 1960, is eligible for the SARA Sevilla certification sponsored by Spanish American Radio Amateurs of Sevilla. Some can-

(Continued on page 162)

Immediate Visual Contact!

WITH EVERY CALL AREA
ON EARTH . . .

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AND

wall map indicator

A beautiful, 16" diameter Great Circle indicator multi-colored world map makes a decorative as well as practical unit for your ham shack. Countries and call areas outlined and labeled. Moving wedge of light 10" wide at perimeter shows beam width and direction at every moment. Circumference calibrated in 1° units. Available centered on West Coast, Midwest or East Coast. Compass rose available for other countries.

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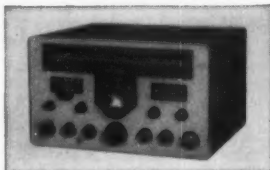
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The all-new E-V RME6900 Ham Receiver features a panel layout engineered for true ease of operation. All switches have been especially selected for easy, positive action; all controls for smooth, sure adjustment; and the weighted dial knob for rapid, controlled bandspreading or precise fine tuning. These design details make the RME6900 a *real* delight to handle and operate

see page 119

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A high grade assembly, flywheel loaded, manufactured to fine tolerances, provides a smooth positive drive with a reduction ratio of 110:1. The vernier with its 100 divisions rotates 5 times for one pointer traverse, giving 500 divisions with positive reset readings. A cam adjustment on the vernier assures correct zero setting. A spring loaded lockjaw arm maintains tension of the pointer drive. Overall dimensions 9 3/4" x 5 3/4".

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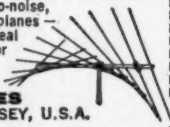
South America — LU2AO, as acknowledged by W1BID, invites your participation in a marathon-styled First International CRV (Centro Radio Veteranos club) Competition to run from the 21st of this month to December 21st. The object is for non-CRV people to contact as many LU members of CRV as possible, and vice versa, once per band, swapping the usual RS7001, RS7002, etc., serials, the "T" omitted on phone. There are about 200 CRV-member LUs; your best bet probably will be to watch for their "CQ Test" calls. The scoring isn't crystal clear in CRV's initial announcement, so we suggest you obtain full information from LU2AO or LUICRV to prepare your entry paperwork before the December deadline. Lists of CRV members also may be available. "Certificates are offered to the top single-operator and c.w. scorer in each country." K2GX1 says CE2MH watches for W/Ks on 7296 kc, regularly on week-end mornings. Ex-VP4WD, now back at G3TA, writes WITS: "Before I left Tobago I put in a lot of verbal spade-work on VP4TAQ, a resident of the island, trying to get him to become active. I think this will bear fruit and hope to hear very soon that he will be active from there. Fine cooperation was received from Wa 2KIR 4CXQ 8KPL and others during my VP4 stay." CX2AM cites G6ZO as the first G-man and first c.w.-only entrant to achieve RCU's 33 *Orientales* certification. WGDXC hears that CE6AC has a fresh 700-watt c.w./a.m. contraption with which CE3QG feels they'll be much more accessible on DX bands.

Hereabouts — RSB (Bermuda) urges all U. S. and Canadian amateurs to participate in its Bermuda Amateur Radio Contest for 1960, a 7-through-28-Mc. c.w.-plus-phone affair scheduled for 0001 GMT, May 14th, to 2359 the 15th, and May 28th-29th, same times. W/K/VE/VOs will transmit RS or RST reports to VP9s; VP9s will return RS or RST plus parish locations. Each completed contact (one QSO per station per band) counts 3 points. Multiply your all-band QSO points by the number of band-parishes worked, to obtain final score. Logging should be done in GMT and each contestant must sign a statement that all rules and regulations have been observed. Official log sheets and report forms are available from Contest Committee, Radio Society of Bermuda, P.O. Box 275, Hamilton, Bermuda, and results should be mailed to the same address no later than June 30, 1960. This is a single-operator competition. You may find yourself in line for an airline ticket to Bermuda plus a week's stay for two at one of the colony's leading hotels. Furthermore, the highest score in each U. S. and Canada call area will merit a certificate of performance signed by His Excellency the Governor. RSB is ten years old this year — more power to 'em. ARRL's Midwest Division Director ducked late-winter chills up our way in good DX style. "The recent flurry of activity from VP1JH is largely due to W0NWV who operated that station in this year's ARRL DX Test," declares K0WQI. W8YIN bravely undertakes s.a.b. DX editorial duty for two amateur radio periodicals and can be found digging up data on 14,280, 21,420 or 28,680 kc. when not chasing rare ones himself. Among other worthy objectives, Mickey intends to plump for more effective sideband DXploitation of 7 Mc. W3JEJ, responding to our March aside on the matter, also logged two Christmases in 1945. Fred was returning home aboard Liberty SS *Jane Addams* and successfully wangled two Christmas dinners thanks to a turkey surplus in the galley. Forty-meter code specialist CM8EM chases Idaho, Nev., Utah and Wyoming for 7-Mc. W8S, according to W7LZF. K2s LSU OQq and TVY are all set to invade 8s. Brier for a DXpeditionary journey this August. Others interested in arranging details for similar FPS ventures may find instructions available from K2OQA. HH2Z calls attention to the availability of Amateur Radio Club of Haiti's certification for the working of 20 HHs, any
(Continued on page 164)

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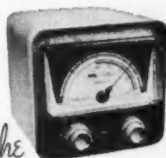
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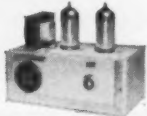
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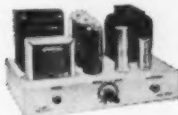


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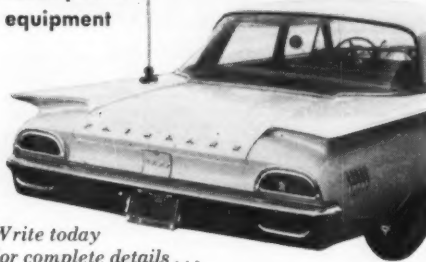
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see page 119

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Jacksonville, Florida

band and mode, with endorsement stickers on tap for each 10 additional. "Since its announcement last August, seven U. S. amateurs have earned this award. There are about ninety Haitian hams licensed at present; ten or fifteen of these are very active on several bands, and 40 or 50 are moderately active." Check with Bill or RCH headquarters for all specifics. . . . S.W.I. A. Rugg commends W0IUB's Worked United Nations certification as briefed here in March. Roy welcomes inquiries. . . . It's that time of year when North American DX gossip naturally turns to Cocos Island, especially T198B. . . . "DXCC 2" No. 26 falls to W3SOH who ably met the modest requirements enumerated on p. 69, July 1959 QST. Phil is the third U. S. Three to turn the trick. . . . In CRAG's organ QUA we see that new officers for the Guatemalan society are TG9m TL, pres.; AX, v.p.; RO, secy.; AZ, treas.; BH GS and RK, board. . . . OVARA wheels for the new stint: W8s EV, pres.; JIN, v.p.; RSU, secy.; and TJM, moneybags. Radioteletypists in the club report recent DX work with G3CQE, KL7s MZ USA, TG9AD, XE1BI and ZL1WB. Ding-ding!

Ten Years Ago In "How's DX?"—An "improved" general-call procedure is discussed in the May 1950 column's opening commentary. . . . The 75-meter gear report phoned QSOs with CN8ML, J42AZ, LX1W, OK1MR, TG9AD, YP's SAR and 7NN, while 80-meter men toy with CT3AB, FM8AD, MD7WE, OY3IGO, PY7WS, SV0WH and VP5BF. . . . Forty's best are EKITY, GD3UB, TA3FA and ZE2JN. . . . On 20 c.w. there are ACs 38Q 4NC 4RF, AP5B, CR10s AA AB, FE8AB, HS1SS, MDs 4GC 4KW 7XP, MF2AA, M13s DX ZZ, MS4FM, PJ5s FN RE, PKs 1LR 2ZZ 3LC, ST2HD, TA3GVU, VRs 1A SPL, ZC6UNJ, Z8s 6DO/7 7B and 9D. Twenty phone is the playground of AP2N, EK1AD, F88PH, HZ1KE, IIR/C/Trieste, MDs 2AF 7HV, MP4BAD, PK4AF, SV5UN, VKs AJT RD and VR5GA. . . . Ten is a pistol, especially likewise, affording AP2G, K44AAT of the B.V.I., MID, MD2MD, M13SZ, MP4s BAB BAE BAO, M84A, MT2BFC, PKs 1UA 3FH 4KS 5HL, V87PS, ZC6AM, ZD4AU, ZP3AW, Z8s and SV8AT. . . . 10-meter sparkers are EK1AO and YR2CC, while PK4IDA does brisk business on 11. . . . HC8GRC of the Galapagos is true expeditionary operating venture of the moment. . . . Photos of PK4IDA, SM5APF and Z81DU join your "How's" picture gallery, while Jeeves & Co. entertain some four-eyed TV victims.

QST

Sweepstakes

(Continued from page 66)

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W6JLO . . . 1,365- 26-21-A-4
K6BEP . . . 1,173- 35-14-A-5
W6VFC . . . 538- 21-10-A-10
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K7IKTY . . . 32,819- 225-50-A-30
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W7ZOC . . . 63- 5-5-A-4
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W6OLU/6 . . . 28,050- 204-55-A-31
K6LZL . . . 18,830- 137-56-A-16
W6NKT . . . 1,680- 35-24-B-6

WEST GULF DIVISION

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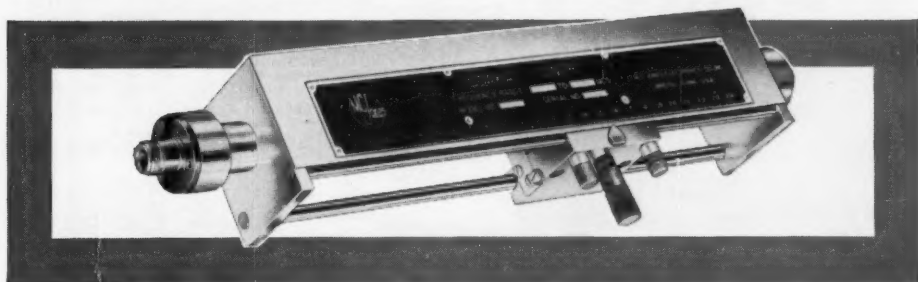
W5MCT . . . 161,352-1124-72-B-40
K5VLN . . . 148,030- 948-70-A-39
W5QF . . . 42,350- 242-70-A-26
K5GIF . . . 36,703- 286-83-A-22
K5SIS . . . 30,960- 191-84-A-19
K5SKI . . . 25,564- 202-51-A-35
K5PFO . . . 17,663- 158-45-A-17
W5AWT . . . 8,430- 112-38-B-5
K5IMC . . . 7,111- 111-11-A-13
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Oklahoma

K5OCX . . . 71,904- 491-61-A-39
W6WNI/5 . . . 64,111- 494-65-B-19
W5VZU . . . 28,975- 190-61-A-32
W5EHY . . . 8,531- 100-35-A-14
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(Continued on page 166)

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VE3DH... 25,906- 211-55-A-18
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VE5MQ... 11,515- 100-47-A-17

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VE6UW... 20,280- 169-45-A-23

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VE7JO... 35,768- 251-57-A-18
VE7JQ... 23,520- 196-48-A-22
VE7XY... 4320- 72-30-B- 9

Ontario
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¹ K28IL, opr. ² K2JVB, opr. ³ W7YQA, opr. ⁴ K0RAU, opr. ⁵ W1WPR, opr. ⁶ Hq. staff, not eligible for award. ⁷ W4YZC, opr. ⁸ K6PSP, opr. ⁹ W6MMC, opr. ¹⁰ W2LHL, opr. ¹¹ VE3BCJ, opr.

ARRL sincerely thanks the following amateurs for submitting check logs that aided in the cross-check of verification or dispute of contacts: W1s IQH RAN, K1AJB, W2CUQ, K2VPS, W3s GDE KUQ, K3HYB, WAHJC, W6s DBB ILZ RHM, WA6FBI, W6VGJW, K8AYJ, KN8OIC, W9s CMQ VYO, K9IWS, W9s FZG OUD, CO7NR.

QST

World Above

(Continued from page 79)

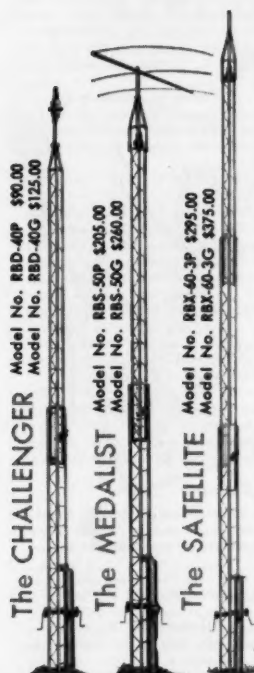
members have a rough time trying to use the first 300 kc. of the band, due to oscillator radiation and to overloading from Channel 13. Cavity filters help on the latter, but if the TV sets radiate in the 220-Mc. band, there is little that can be done about it, except to put the TVI shoe on the other foot.

Practical experience on all bands where high selectivity is used has shown that it is out of the question to tune an entire band of 4000 or 5000 kc. We can use a band that wide, so long as we know where to look for our contacts—but we can't tune it in one sweep after a CQ, and do a reasonable job of digging for weak signals. Weak-signal searching difficulties are compounded if the band is full of wandering TV receiver oscillator birdies, or spurious products from strong TV signals.

Would 221.5 to 222 Mc. be acceptable? If so, W2SHU proposes that the first 100 kc. be used only for c.w. work, and the rest for phone. Another possibility is suggested by the availability of surplus crystals. Two channels that might enter this picture are 8200 kc. (221.4 Mc.) and 8206.67 kc. (221.58 Mc.). These two available frequencies might be a simple way of resolving the c.w. and phone frequency question. Certainly you could change from one to the other without any retuning problems, and the two crystals would cost about 50 cents. Various oscillator circuits would spread the actual operating frequencies around quite a bit, and with present levels of occupancy there should be no QRM problem. Other frequencies can be provided later if need be.

The important thing is to have an expression of opinion. Please, all 220-Mc. operators, let us know what you think about this, so that a definite countrywide recommendation can be made before the summer DX season is in full swing. Do it now, and while you're about it, give us the dope on your 220-Mc. setup and intended schedules. We'll correlate this information and make it available to any interested parties, including W2SHU and the Central New Jersey V.H.F. Society.

(Continued on page 165)



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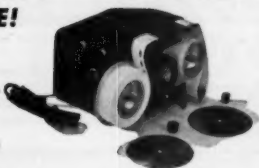
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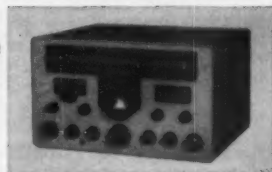
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see page 119

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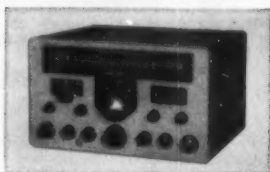
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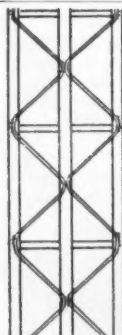
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Amateur TV seems to be picking up steam in a number of areas. How about Los Angeles? W6NAA (Box 111, Glendora, Cal.) would like information on the polarization, section of the band used, voice channel and any other amateur TV practices.

Attention, amateurs with 1200-Mc. gear: Your co-operation is invited in connection with the Project Echo program at Haverford College, Haverford, Pa. Under the direction of Professor Benham, W3DD, a 1250-Mc. kilowatt transmitter will be operating with a 12-foot dish and a low-noise receiving system, in attempts to reflect signals from the Echo satellite, when it is put into orbit some time this spring. Observation of the signal by amateurs is desired. Early in May attempts will also be made to bounce the signal off the moon. Transmissions will be in the form of coded c.w., or a 5-millisecond pulse and 15-millisecond delay. Voice modulation may be tried. The antenna system has a gain of 1400 and a beamwidth of 5 degrees.

This information has already been sent to a list of amateurs known to have advanced gear. If you have not been contacted, and you have equipment of high performance for the amateur 1215-Mc. band, please send details at once to Peter Arnow, Box 49, Haverford College, Haverford, Pa.

OES Notes

K1CXX, Auburn, Me. — Several stations on 2 in Northern Vermont and New Hampshire, and in Maine, active nightly after 1900. Most-used frequencies are 144.45 and 144.9 Mc.

W1HDQ, Canton, Conn. — Would like to see more c.w. activity on 220 Mc. during auroras. Worked K2CBA with very strong signal during excellent aurora of March 15, but heard no other stations. Received 85 heard report from W8CSW, Westerville, Ohio, 500 miles. Signals on 50 and 144 Mc. at this time were among the strongest ever heard via aurora.

W3FEY, Lancaster, Pa. — Local 220-Mc. activity improving, with W3s HZU AJD CAJ KKN and JYL on quite regularly. Keeping nightly sked with W4VSN, Oak Ridge, Tenn., at 2130 EST; no results as yet. Signals poor on K2CBA sked (240 miles) during winter months.

W4CIN, Birmingham, Ala. — Looking for business on 145.17 Mc. nightly at 2200 CST, except Monday and Friday.

K4EUS, Chester, Va. — Worked W4LTU on 144 Mc. via reflection from Shotput balloon Jan. 27. Is this first amateur QSO using manmade object in space? Will be trying for contacts when Echo satellite is sent into orbit, transmitting second half of each minute on 144.068 Mc.

W7EGN, Whitefish, Mont. — March 15 aurora made possible 50-Mc. contacts with W7CJB, Missoula, W7LHK, Collins, Mont., W7GUH and W7INX, Portland, Ore., W7ID1, Seattle, and W7QGG, Port Angeles, and K7EUV, Kelso, Wash. QSO with W7LHK may have been first between two Montana v.h.f. stations on opposite sides of the Continental Divide.

K7GSR, Wheaton, Ill. — Some 20 stations now on 220 Mc. in Chicago, with more on the way. Band is fine for duplex phone work with 144-Mc. stations.

K9MLI, Winnetka, Ill. — Chicago area 50-Mc. net schedules: 6-Meter Club — Tues. 2200, 50.4 Mc.; Cook County CD — Mon. 2000, 50.4 Mc., Chicago CD — Thurs. 2200, 50.54 Mc.

W9NPX, Two Rivers, Wis. — Acting as net control for Manacord V.H.F. Net, Wed., 1930 CST, 145.2 Mc. Stations outside Manitowoc County are welcome to check in. Also report into Milwaukee area net on 145.66 Mon., 2000 CST.

QST

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"G4ZU PAT."

MINIBEAMS & BIRD CAGES

Up till now man's best friend has been his dog but the DX-conscious ham has another —his G4ZU Super Coax Mini-beam for 10/15/20. Actually it's simple:

- Aptly engineered by men who know
- Ample made of high tensile aluminum alloy
- Broad banded for the kilocycle jumpers
- Better balanced and light weight too (16 lbs.)
- Correctly tuned on all bands
- Correctly designed for maximum results

Yes, with the G4ZU, you get Rolls Royce quality with Renault prices. You can't beat that combination; neither can you beat the **NO TRAP, NO COIL** Coax Fed Mini-beam with the Binodal coupler that gives great gain on 10 and 15. All this in a 13' 6" turning radius. It's astounding, it's terrific—it's true. Only **\$89.50**. 34' telescopic mast, easily rotatable, with no concrete, **\$49.50**. "20 Meter Cage"—the Boys in Phase Antenna—the ultimate for the lower frequencies with a radius of only 8 feet—**\$55.00**. Available now. Don't go through another season with an inferior antenna.

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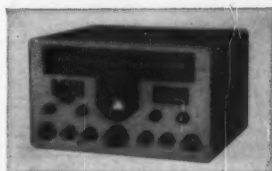
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KLAUS RADIO & ELECTRONICS

We like the Electro-Voice RME6900 for

- Operating Versatility
- ✓ OPERATING EASE
- Precision Design
- Improved Selectivity
- Flexible Operation



The all-new E-V RME6900 Ham Receiver features a panel layout engineered for true ease of operation. All switches have been especially selected for easy, positive action; all controls for smooth, sure adjustment; and the weighted dial knob for rapid, controlled bandspreading or precise fine tuning. These design details make the RME6900 a real delight to handle and operate.

see page 119

KLAUS RADIO & ELECTRONICS

403 East Lake

Peoria, Illinois

GUARANTEED CRYSTALS!

CITIZENS BAND — 11 METERS — .005% TOL.

26.965 mc to 27.225 mc—3rd Overtone
Herm. Sealed or FT-243 \$3.75

13.4825 mc to 13.6125 mc—2nd Harmonic
Herm. Sealed or FT-243 \$3.75

6741.25 kc to 6806.25 kc—4th Harmonic
FT-243 Only \$2.99

Special! FT-243 Prec. Calib. to 1st Decimal

2 Meters Exam: *8010.6 x 18—144.190
Exam: *8010 x 18—144.180
Note—10 KC difference between the above

6 Meters Exam: *8340.6 x 6—50043.6
Exam: *8340 x 6—50040
Note—3.6 KC difference between the above

Calibrated FT-243 as exam. above* spec. ea. \$1.29
Thin-Line FT-243—5 Met-30 meg. to 57.44 meg. ea. \$1.79
52.45 meg. to 54 meg. ea. \$2.39

2 Meters, 144 meg. to 148 meg. ea. \$1.79
Hermetically Sealed Fund. 01 Tol. ea. \$2.50

NOVICE BAND FT-243 Fund. or DC-34 Freq. \$1.29

80 Met. 3701-3748—Steps of 1 KC. FT-243 or DC-34

40 Met. 7150-7198—Steps of 1 KC. FT-243 only

Dbl. to 40 Met. 3576-3599. Steps of 1 KC. FT-243 or DC-34

15 Met. 5276-5312—7034-7083 Steps of 1 KC. FT-243

4035	5005	5975	6400	6873	7464	7461	7210	8006	8275	8608	8608
4045	5235	5995	6405	6875	7473	7450	7820	8015	8380	8610	8610
4050	5345	6000	6406	6880	7475	7453	7825	8020	8385	8615	8615
4055	5375	6006	6431	6906	7483	7460	7830	8047	8390	8620	8620
4110	5355	6015	6435	6915	7504	7470	7841	8073	8421	8625	8625
4125	5397.5	6040	6440	6940	7500	7470	7840	8075	8425	8630	8630
4145	5415	6040	6440	6940	7504	7470	7841	8075	8425	8630	8630
4190	5437.5	6050	6473	6950	7508	7473	7845	8080	8430	8635	8635
4215	5465	6075	6475	6975	7516	7475	7853	8100	8435	8640	8640
4235	5485	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4275	5500	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4310	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4320	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4330	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4340	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4350	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4360	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4370	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4380	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4390	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4400	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4410	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
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4470	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4480	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4490	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4500	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
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4580	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
4590	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
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4680	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
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5120	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
5130	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
5140	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640
5150	5545	6100	6480	6975	7516	7475	7853	8100	8435	8640	8640

**GOVT. STOCK
FT-243 79¢
FUND. FREQ.**

FT-243—From 1005-2999. Steps of 5 KC ea. \$2.39

SPECIAL ITEMS

FT-241 55B Matched Pairs Pr. \$1.95
FT-241 55B Low Freq. Xals—370 to 540 KC . . .

NEW AMECO

2 & 6 METER CONVERTERS

COMPLETE KIT
AS LOW AS
\$19.95

2-METER FEATURES INCLUDE:

- Crystal controlled.
- New 6ES8 high gain, low noise, cascode first RF amplifier. 6U8A second RF amplifier-mixer. 6AU6 oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure better than 4 db.
- Gain—over 30 db.

6-METER FEATURES INCLUDE:

- Crystal controlled.
- 6BS7 cascode RF amplifier and 6U8A mixer-oscillator.
- Spurious and image rejection—over 70 db.
- Noise figure—better than 4 db.
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The Ameco Converters are housed in a compact (2" x 2 1/4" x 5") 2-piece brushed copper chassis. Brings in any signal that can be heard on any commercially available converter. The IF output on both converters are easily changed to allow converter to have any output frequency for hook-up to any receiver. The power requirements of 16 ma. at 100 to 150 volts DC and .85A at 6.3 volts AC for the 6-meter converter or 30 ma. at 100 to 150 volts DC and 1.15A at 6.3 volts AC for the 2-meter converter can be obtained from the receiver or from the Ameco Power Supply, Model PS-1, also housed in a 2-piece copper chassis. Power supply can deliver 50 ms. at 125 volts DC & 2A at 6.3 volts AC & may be used to supply power to many accessories around the ham shack.

10 meter, 15 meter, Citizens band, Police & Fire converters also available

Converter complete with tubes and crystal for 7-11 Mc. or 14-18 Mc. in kit form with instructions.....	6-meter	2-meter
WIRED AND TESTED (with tubes and crystal).....	\$19.95	\$23.95
Kit or wired models for any other output frequency—\$1 extra.....	27.50	33.95
Power Supply complete in kit form. Model PS-1.....		10.50
WIRED AND TESTED, PS-1W.....		11.50

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VAN SICKLE RADIO SUPPLY CO.
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COMMUNICATOR OWNERS

Mount your Model I, II, or III over the transmission hump. No bolts or adjustments. Welded steel rack goes in and out in seconds. \$4.95 postpaid.

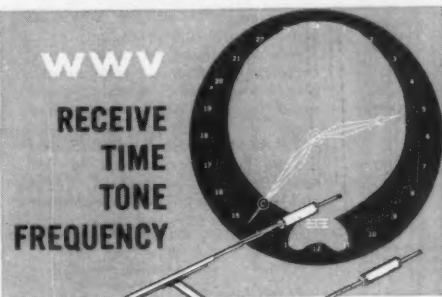
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E-Z WAY TOWERS, INC.
P. O. BOX 5491 - TAMPA, FLA.



greater
long path
reliability

with a **MOSLEY WWV-33**

Mosley Electronics Inc.
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CRANK-UP TOWERS

give you the

**"GREATEST
HEIGHT-PER-
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For optimum results there is an optimum antenna height above ground. With a TRI-EX Crank-Up Tower you can pick your best height, based on the band being used, conductivity of ground and clearance of surrounding objects.

Expertly engineered, and proven through years of actual use, the "H" towers support even the largest 20 meter and tri-band beams.

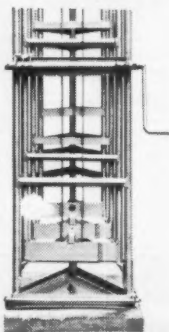
New iron-phosphate rust-proof undercoating, plus epoxy resin primer, plus baked enamel finish, protects tower for years of maintenance-free use.

The winch is ratchet operated, and can be locked for safety. The "H" series tower is available in 37, 54 and 71 ft. models. Towers are shipped complete with base and crank.

Priced from

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Write for full details, and for catalog showing complete Tri-Ex line... the "greatest Height-per-dollar" value you can buy.

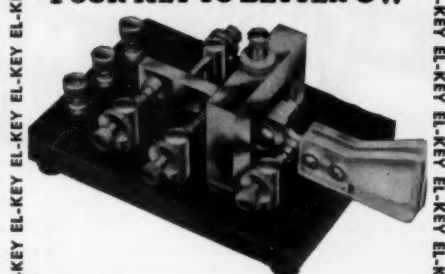


TRI-EX TOWER CORP.

129 EAST INYO STREET
TULARE, CALIFORNIA

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"YOUR KEY TO BETTER CW"



The new EL-KEY designed specifically for Electronic Keyers. No worries about makeshift keys, cut-up bugs, etc. EL-KEY gives you a sound keying lever for your new or old keyer at a price you can afford.

CHECK THESE FEATURES: Solid black cast base, 3 1/2" x 5" ✓ Weight 3 1/4 lbs. ✓ Completely adjustable stops, contacts and spring tensions ✓ Machined brass yoke, arms, posts ✓ Chrome plated ✓ Silver contacts ✓ Double-lucite paddles ✓ Non-skid rubber feet ✓ For right hand or left hand sending ✓ Fully guaranteed.

Excellent as a **SIDE SWIPER!**

Low price—**\$15.50** postpaid in U.S.A.

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EACH of our stores has a very large stock of the best A-1 reconditioned equipment at lower prices and subject to your trial and approval. Equipment carries same 90 day guarantee as new equipment. Equipment may be traded back within 90 days at full price on new equipment. Our time payments save you money because we finance ourselves. Write or phone or visit either of our stores to get better equipment at less cost and on better terms.

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"The World's THRIFTIEST Light Plants"

Have a steady, dependable 115 v. of AC electricity for receivers, transmitters, antenna motors, emergency lights, etc. ... for radio amateurs, camps and Civil Defense ... at **DIRECT-TO-YOU FACTORY PRICES!** No wiring needed ... just plug in.



Exclusive new **ELEC-TRONIC BRAIN** provides instant full power upon demand, holds thrifty idle otherwise. Saves fuel cost ... doubles engine life! Available on all our plants. Built by experts dedicated to bring you a better product!

PUSH BUTTON START

Model illustrated, our portable 700 watt plant. 2.3 H.P. easy-starting Briggs-Stratton engine. Radio shielded, shock mounted ... hams report less hash than on commercial power line. Complete with voltmeter and built-in winding to charge auto batteries. Easily fits in car trunk. Wt. 72 lbs. ... **\$143.50**

1200 Watt Plant (Item 45) same as item 24 but with larger generator and engine ... 50% greater output ... **\$199.50**

If **ELECTRONIC BRAIN** desired, specify and add \$30.00.

We make all sizes to 100,000 Watts. Write for information.

Send 10¢ for Big New Catalog. Free with order.

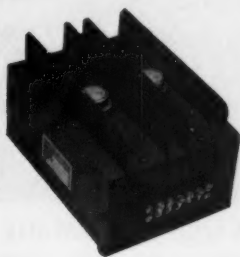
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MOBILE POWER SUPPLY

MODEL
A12/600/200
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\$59.50



This 12V input dc to dc transistorized converter is conservatively rated for continuous output of 120 watts at 600V or 300V, or any combination of 600 and 300 volt loads totaling 120 watts.

High efficiency, small size, and light weight, plus freedom from maintenance, conserve your battery and increase the enjoyment of mobile operation.



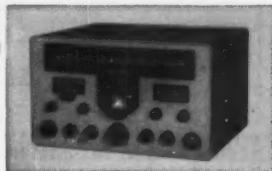
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**D & J ELECTRONIC
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We like the Electro-Voice RME6900 for

- ✓ OPERATING
VERSATILITY
- Operating ease
- Precision
Design
- Improved
Selectivity
- Flexible
Operation



The all-new E-V RME6900 Ham Receiver is designed for optimum performance in *all* modes of amateur operation — not just one or two. Whether your preference is operating SSB, AM, or CW, the mode is quickly and precisely shifted through one unified selector. Regardless of your operation, this rugged performer *always* delivers real solid armchair copy.

see page 119

D & J ELECTRONIC SUPPLY CO.
207 Elm Rd., S.E. Warren, Ohio

NOVICES!

Lose Your "N" and Get a Tan ON TOP OF THE BLUE RIDGE MOUNTAINS

Two weeks of fun at camp — and a chance to earn your General Class ticket, besides!

This Co-Ed Amateur Radio Camp, YMCA owned and operated, is designed for just 60 campers. There is no age limit but a Novice or Technician license is required. Time will be divided between radio classes and the usual camp activities such as swimming, hiking, softball, etc.

Entire Staff consists of licensed hams who are instructors in Electrical Engineering in some of our finest colleges and universities.

Camp opens on August 14th and every effort is being made to have an F.C.C. examiner visit the camp to give the General Class examination on the closing date of August 30th.

Tuition of \$150 includes usual camp expenses
—notebooks, textbooks, Health and Accident Insurance, as well as horseback riding.

Since applications will be considered in the order they are received, send now for booklet and application blank to
C. L. Peters, K4DNJ, Director, using attached coupon:

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General Secretary
Gilvin Roth Y.M.C.A.
Elkin, North Carolina

Q5

Please send me the Booklet and Application Blank for the Camp Albert Radio Session.

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CITIZEN BAND-CLASS "D" CRYSTALS

All 22 Frequencies in Stock

3rd overtones, .005% tolerance—to meet all F C C requirements. Hermetically sealed HC6/U holders. 1/2" pin spacing—.050 pins. 1.093 pins available, add 15¢ per crystal.

Add 5¢ per crystal for postage and handling.

\$2.95 EACH

The following Class "D" Citizen Band frequencies in stock (frequencies listed in megacycles): 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.045, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225

Matched crystal sets for Globe, Gonset, Citi-Fone and Hallcrafters Units . . . \$5.90 per set. Specify equipment make.

RADIO CONTROL CRYSTALS IN HC6/U HOLDERS

In stock for immediate delivery (frequencies listed in megacycles) sealed crystals 26.995, 27.045, 27.095, 27.145, 27.195, 27.255, tolerance .005%, 1/2" pin spacing . . . pin diameter .05 1.093 pin diameter, add 15¢) . . . **\$2.95 ea.**

FUNDAMENTAL FREQ. SEALED CRYSTALS

In HC6/U holders:
From 1400 KC to 4000 KC, .005% Tolerance . . . **\$4.95 ea.**
From 4000 KC to 15,000 KC any frequency
.005% Tolerance . . . **\$3.50 ea.**

SEALED OVERTONE CRYSTALS

Supplied in metal HC6/U holders
Pin spacing .486, diameter .056
15 to 30 MC, .005 Tolerance . . . **\$3.85 ea.**
30 to 45 MC, .005 Tolerance . . . **\$4.10 ea.**
45 to 60 MC, .005 Tolerance . . . **\$4.50 ea.**



QUARTZ CRYSTALS FOR EVERY SERVICE

All crystals made from Grade "A" Imported quartz—ground and etched to exact frequencies. Unconditionally guaranteed! Supplied in:

FT-243 holders	MC-7 holders	DC-34 holders	FT-171 holders
Pin spacing 1/2"	Pin spacing 3/4"	Pin spacing 3/4"	Pin spacing 3/4"
Pin diameter .092	Pin diameter .125	Pin diameter .156	Banana pins

MADE TO ORDER CRYSTALS • Specify holder wanted

1001 KC to 2600 KC:	
.01% Tolerance . . .	\$2.00 ea.
.005% Tolerance . . .	\$2.75 ea.
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Amateur, Novice, Technician Band Crystals

.01% Tolerance . . . **\$1.50 ea.**—80 meters (3701-3749 KC), 40 meters (7152-7198 KC), 15 meters (7034-7082 KC), 6 meters (8335-8650 KC) within 1 KC

FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (all except 455 KC and 500 KC) . . . **50¢ ea.**

Pin spacing 1/2" Pin diameter .093

Matched pairs = 15 cycles **\$2.50** per pair

200 KC Crystals, **\$2.00 ea.**; 455 KC Crystals, **\$1.50 ea.**; 500 KC Crystals, **\$1.50 ea.**; 100 KC Frequency Standard Crystals in HC6/U holders **\$4.50 ea.**; Socket for FT-243 crystal **15¢ ea.**; Dual socket for FT-243 crystals, **15¢ ea.**; Sockets for MC-7 and FT-171 crystals **25¢ ea.**; Ceramic socket for HC6/U crystals **20¢ ea.**

(Add 5¢ per crystal for postage and handling)

Write for new free catalog #860 complete with oscillator circuits

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RUSH YOUR ORDER TO OUR NEW PLANT!

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ATTACH THIS COUPON TO YOUR ORDER FOR SHIPMENT VIA 1ST CLASS MAIL AT NO EXTRA COST

TERMS: All items subject to prior sale and change of price without notice. All crystal orders must be accompanied by check, cash or M.O. with **PAYMENT IN FULL**. NO COD'S. Add 5¢ per crystal for postage and handling charge. Q-50

Positive band change in an instant



CHANGE BANDS WHILE DRIVING

Your Receiver and Transmitter are band-switching
... NOW—your antenna is band-switching.

AUTENNA TUNES AMATEUR BANDS

75 - 40 - 20 - 15 - 10 Meters

- Meter indicator instantly identifies band the antenna is tuned to. No guessing!
- Positive noise free silver plated contacts.
- Installed or removed in seconds with Kwik-On connectors for trunk storage.
- Will handle up to 100 watts.
- Factory tested—guaranteed.

Only **\$69.95** Amateur Net—Plus Postage

Designed for use with 60" whip. Complete with two Kwik-On connectors, Whip Flexor spring, Meter and Control panel.

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At ARMIES ELECTRONICS

We like the Electro-Voice RME6900 for

- ✓ OPERATING
VERSATILITY
- Operating ease
 - Precision Design
 - Improved Selectivity
 - Flexible Operation



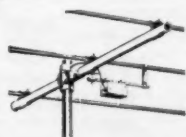
The all-new E-V RME6900 Ham Receiver is designed for optimum performance in *all* modes of amateur operation — not just one or two. Whether your preference is operating SSB, AM, or CW, the mode is quickly and precisely shifted through one unified selector. Regardless of your operation, this rugged performer *always* delivers real solid armchair copy.

see page 119

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Youngstown, Ohio



BEAM EXPENSE

can be lowered with a beam designed to last.

- THREE BAND • TWO BAND
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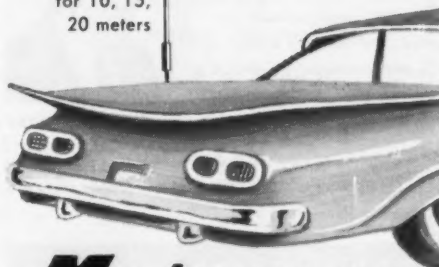
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BANDS WITH ONE ANTENNA!

**MOSLEY
Trap Mobile**

No band switching!

Model MA-3
for 10, 15,
20 meters



Mosley Electronics Inc.

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REPAIRS, modernization, calibration and alignment by competent engineers using factory standard instruments. Collins, Globe, Hallicrafters, Hammarlund, Harvey-Wells, National Co. Service representative for Hickok and RCA Test Equipment Factory parts. All work guaranteed. Our twenty-fourth year.

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YOU CAN EARN EXTRA INCOME

This free booklet tells you how!

Just like hundreds of other hams . . . you can use your radio knowledge to earn thousands of dollars! Commercial mobile-radio communications are booming! These stations need competent, continuous service, and pay good money!



LAMPKIN 105-B FREQUENCY METER. RANGE 0.1 TO 175 MC AND UP. PRICE \$260.00 NET.

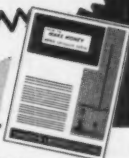
THE
PREFERRED
MOBILE-
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METERS



LAMPKIN 205-A FM MODULATION METER. RANGE 25 TO 500 MC. PRICE \$270.00 NET.

MAIL COUPON TODAY!

THIS FREE BOOKLET
TELLS HOW YOU
CAN START YOUR
OWN BUSINESS IN THIS
LUCRATIVE FIELD!
SEND FOR IT TODAY!



LAMPKIN LABORATORIES, INC. Bradenton Florida

LAMPKIN LABORATORIES, INC.
MFG. DIVISION, BRADENTON, FLORIDA
AT NO OBLIGATION TO ME, PLEASE SEND ME "HOW
TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE"—and data on Lampkin Meters.

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We're interested in selling more new amateur equipment. To make it easier for you to buy, we will make the best possible trade-in allowance on your used gear.

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Only 10% down payment is required. Our carrying charge is 6% per annum on the unpaid balance. Your down payment may be cash or trade-in credit.

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I have the following used gear to trade: (Please use this code to describe it.) 3. Like new, little use; 4. Minor signs of use, no major blemishes; 5. Good condition, with minor modifications; 6. Has major modifications, or requires major repairs

I am interested in purchasing the following new equipment:

No obligation to buy is implied.

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Name: _____

Street No. or R.F.D.: _____

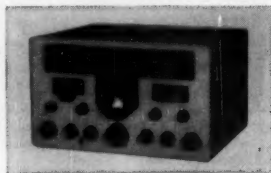
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At HUDSON RADIO & TELEVISION CORP.

We like the Electro-Voice RME6900 for

- Operating Versatility
- Operating Ease
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- Improved Selectivity
- ✓ FLEXIBLE OPERATION



The all-new E-V RME6900 Ham Receiver provides many features specifically designed for the flexibility required in today's amateur communications. This rugged beauty boasts logging scale, horizontal S-meter, professional control grouping, all-mode noise limiting, controlled fast attack AVC, crystal calibrator for tuning accuracy, plus numerous other features found only on far more expensive receivers.

see page 119

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\$1.75 per 100 cards—Postpaid U. S. only
(Fla. hams add sales tax).



These cards are printed on glossy stock with red call letters, name and QTH. QSO information, etc., printed in green. All orders mailed within ten days. No C.O.D. Sorry, we cannot make any changes or additions in form or ink at this price. We have only one style. Free sample.

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75-40 METERS



Bandswitching 75-40 Meters
12 Watts AM phone

"MARS"

Miniaturized
MOBILE
TRANSMITTER

\$59.95

Fully Assembled
7 1/4" X 5" X 4 1/4"
Less power supply
IMPORTED

THANKS, FELLOWS... your demand for the "MARS" Thunderbird mobile swamped us... here's what they say: "terrific value," "audio tops", "... "real husky signal" ... Join the gang, send for yours now.

PUSH-TO-TALK CARBON MIKE...\$ 8.95
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Prices F.O.B. San Rafael • In California Add Sales Tax
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How Many Turns?

BESET with a knotty technical problem? Why not let an ARRL Lightning Calculator provide the solution and save hours of operating time, or time you might better spend in constructing that new rig.

IF YOU'RE trying to figure out how many turns to wind on a coil for a particular band, you'll find the answer more quickly by using the Type A Calculator, designed especially for problems involving frequency, inductance and capacity. Direct-reading answers to Ohm's Law problems involving resistance, voltage, current and power may be obtained rapidly on the Type B Calculator. Be sure — and be accurate — with one of these dandy time savers.

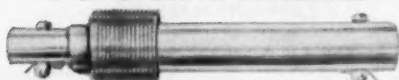


ARRL
LIGHTNING CALCULATOR
Type A or Type B

\$1.25
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THE AMERICAN RADIO RELAY LEAGUE WEST HARTFORD 7, CONN.

4 or 5 BAND ANTENNA



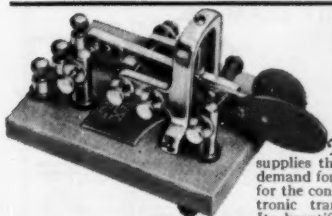
WORK FOUR OR FIVE BANDS WITH ONE ANTENNA
FIVE BAND DOUBLET ANTENNA

Covers 80, 40, 20, 15, and 10 meters. Length 111'. Twin lead 88' 8".
1 KW 5HC-F 5 Band KW Coils \$19.95
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FOUR BAND HI POWER DESIGN

Covers 40, 20, 15, and 10 meters. Length 56' 8". Twin lead 80'.
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All Antennas include coils, twin lead, heavy duty insulators copperweld wire. Ready for installation. ORDER NOW!
Literature available for amateurs and dealers.

GENERAL CRYSTAL CO., INC.
4156 Wilmet Avenue Burlington, Wisconsin



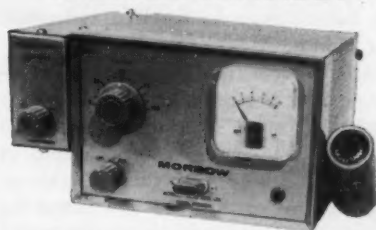
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The Vibro-Keyer supplies the answer to the demand for Vibroplex parts for the construction of electronic transmitting units. Its beautiful beige colored base is 3 1/4" by 4 1/4" and weight is 2 3/4 pounds. It uses the DeLuxe Vibroplex contacts, main frame and super finished parts. Colorful red finger and thumb pieces. Has the same smooth and easy operating Vibroplex trunion lever, adjustable to your own taste. Priced at \$15.95.

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MOBILE SENSIBLY



What's your favorite amateur band? Choose from Morrow's economy line of single band transmitters and converters PW-75 Transmitter and TC-75 Converter illustrated.

Crystal controlled Converter effectively makes a tunable dual conversion super-het out of your broadcast set.

Crystal controlled Transmitter features built-in power supply, push-to-talk with microphone included in price, conservative 8 watts input, high level plate modulation.

Also available for 2, 6, 10, 15, 20, 40 or Citizen Band. All Transmitters available for either 6VDC, 12VDC or 117VAC. Transistorized Converters are self powered by two penlight batteries.

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CONVERTERS: TC-10, 15, 20, 40, 75 or CB \$44.95
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SPECIFY BAND AND INPUT VOLTAGE DESIRED

MORROW RADIO MFG. CO.

P. O. BOX 1627 SALEM, OREGON

Receive "Ham" signals
anywhere, on any set with

**Model ATC-1 Transistorized
Amateur Band Converter**



**SPECIALIST
IN TRANSISTORIZED EQUIPMENT**

**THE ONLY TRANSISTORIZED
CONVERTER
FOR AMATEUR RECEPTION
ON NEW 12 VOLT AUTO RADIOS...**

because Model ATC-1 is self-powered (3 pen-light batteries, shelf life expectancy) and does not require a power supply. Its own power supply guarantees frequency stability—voltage fluctuations in car's electrical system will not affect it.

Simple to connect—one connection to antenna, other to receiver antenna input; only $4\frac{3}{4}'' \times 3\frac{1}{4}'' \times 4\frac{1}{16}''$ —30 ounces—small and light enough to be carried easily, mounted in any convenient spot in car; adaptable to any receiver—receives AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands; the answer to mobile SSB listening—built in BFO plus a high degree of stability make the tuning of SSB, DSB, or CW signals a pleasure; provided with outstanding selectivity on AM phone by the modified "Q" multiplier circuit.

Model ATC-1, \$79.50

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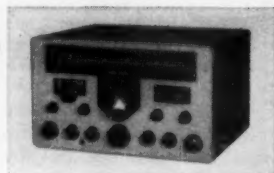
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At BOB & JACKS, INC.

We like the Electro-Voice RME6900 for

- Operating Versatility
- Operating Ease
- Precision Design
- ✓ **IMPROVED SELECTIVITY**
- Flexible Operation



The all-new E-V RME6900 Ham Receiver has literally been engineered for today's highly active ham bands. It combines every feature necessary to "pull-in" that all-important signal with real S9 wallop. The RME6900 provides better than 1 uv sensitivity, exceptionally sharp selectivity, plus tunable T-Notch filtering for true QSK.

see page 119

BOB & JACKS, Inc

4507 Forest Avenue

Des Moines 11, Iowa

TRI-BAND-QUAD

COMPLETE PLANS \$1.

- No Stubs
- High F to B
- Very Broad
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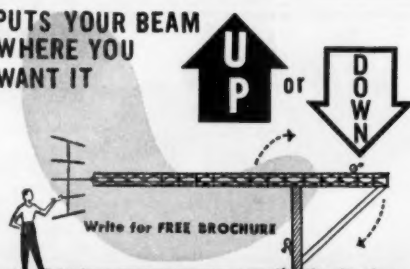
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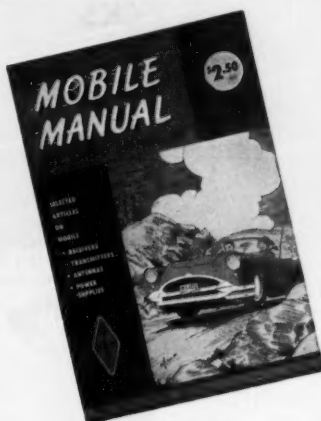
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**PUTS YOUR BEAM
WHERE YOU
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\$2.50

U.S.A. Proper
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CONTENTS include a section on receiving, with valuable information on automotive noise suppression; a group of articles describing over 30 different mobile transmitters; sections on mobile antennas and power supplies; and excerpts from FCC's regulations governing mobile operation. The Mobile Manual for Radio Amateurs should be on the bookshelf of everyone interested in the installation, maintenance and operation of mobile stations.

American Radio Relay League, Inc.

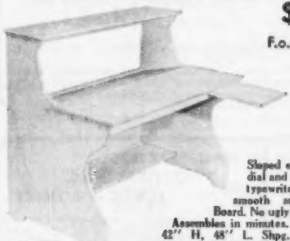
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CONNECTICUT

HAM OPERATING DESK KIT

\$39.95

F.o.b. Orange, N. J.

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STURDY
FITS ANY
DECOR**



Shaped equipment shelf for easy dial and meter reading. Slide-out typewriter panel. Constructed of smooth surfaced $\frac{3}{4}$ " Particle Board. No ugly edges. Takes any finish.

Assembles in minutes. Dimensions: 30 $\frac{1}{2}$ " D, 42" H, 48" L. Shpg. wt. 95 lbs. Shipped express or freight collect. Send check or money order to:

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FOR
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Regardless of discouraging experience, learning Code is extremely easy and fascinating. It definitely does not have to be third degree punishment. My automatic transmitter is really automatic. In a matter of seconds you select just a few letters, an entire lesson, any number of lessons or the entire record of seven lessons engraved in copper and there is no stopping or changing anything. You will agree that it is a most marvelous method. Let me send you the full story.



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— R. G. MILLER —

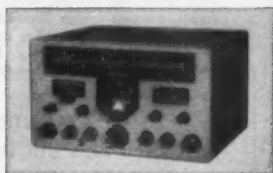
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We like the Electro-Voice RME6900 for

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The all-new E-V RME6900 Ham Receiver is designed for optimum performance in *all* modes of amateur operation — not just one or two. Whether your preference is operating SSB, AM, or CW, the mode is quickly and precisely shifted through one unified selector. Regardless of your operation, this rugged performer *always* delivers real solid armchair copy.

see page 119

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Several qualified engineers will be selected to join in a program which is advancing the state-of-the-art of

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Background in these areas will be developed through a training program in our Bladensburg, Maryland laboratories. Engineers selected will become part of a team extending experiments of the Research and Development Department to the field, in both Domestic and Overseas assignments, and will have ample opportunity to develop technically.

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 - RDF Systems
 - Doppler RADAR Systems
 - Amateur Radio Enthusiast
- ✓ FCC License, 1st or 2nd Class.

They must be willing to accept assignments in areas where dependents are not permitted for periods up to one year. Differential paid for overseas assignments.

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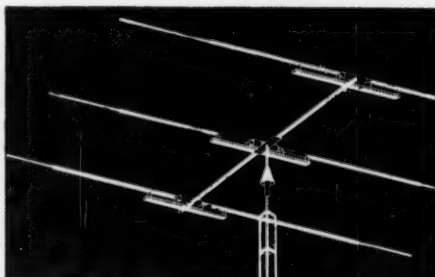
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MODEL VPA 20-3
 20 meter beam

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 New location —
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A
Lightning Rod
 To Protect
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Write for FREE BROCHURE



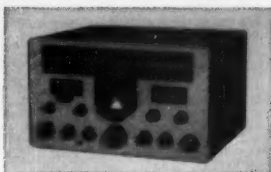
E-Z WAY TOWERS, INC.
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HOBE'S HAM SHACK

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- Operating Versatility
- Operating Ease
- Precision Design
- ✓ **IMPROVED SELECTIVITY**
- Flexible Operation



The all-new E-V RME6900 Ham Receiver has literally been engineered for today's highly active ham bands. It combines every feature necessary to "pull-in" that all-important signal with real S9 wallop. The RME6900 provides better than 1 uv sensitivity, exceptionally sharp selectivity, plus tunable T-Notch filtering for true QSK.

see page 119

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"... MOST INTELLIGENT APPROACH ..."

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The EASY WAY

No Books To Read - No Visual Gimmicks To Distract You. Just listen and learn

Based on modern psychological techniques—This course will take you beyond 13 w.p.m. in

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Album Contains
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STANDARD FOR SSB PERFORMANCE

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30 years selling to hams. Easy terms, big trade-ins. Largest stock of all amateur radio transmitters and receivers in the Carolinas. Try us first—write Tenny Freck, W4WL.

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(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash contract discount or agency commission will be allowed.

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signature are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GHI, 1010 Monte Dr., Santa Barbara, Calif.

2ufd 4000v. DC capacitors, \$5.00 each, or 2 for \$9.00. F. G. Dawson, 5740 Woodrow Ave., Detroit 10, Mich.

COAXIAL Cable. New surplus RB-54A/U, 58 ohms impedance —30 ft. prepaid, \$1.00. Radio magazines, buy, sell, trade, R. Farmer, 3000 No. Columbia, Plainville, Texas.

ALL types of transmitting and receiving tubes wanted. Also aircraft or ground receivers and transmitters. Hamcar or test equipment. For immediate action for cash write or phone Ted Dames, W2KUV, 308 Hickory St., Arlington, N. J.

MOTOROLA used FM communications equipment bought and sold W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WANTED: Military or Industrial laboratory test equipment. Electronics, Box 399, Mt. Kisco, N. Y.

S.S.B. xfrms, exact set of 3 (thermally sealed) for W2EWL Special, brand new, \$3.00 postpaid. New compact G-E 100-watt modulation xfrm, multi-impedance (10 lbs.), \$6.25; new Eimac vacuum condenser, 12u at 12 kilovolts, \$5.50; G-E Pyranols, 4 ufd at 1000 v.d.c. (330 vac) min. 4 for \$3.50. Please include postage, no c.o.d.'s. Tucker, W2HLT, 51-10 Little Neck Parkway, Little Neck 62, N. Y.

WANTED: Commercially built Single Sideband transmitting and receiving equipment like Collins or equivalent. Al T. O'Neill, Lake City, Minn.

LEECE-NEVILLE 6 volt 100 amp. system—alternator regulator and rectifier, \$45; also 12 volt 100 amp. system, \$85. Guaranteed no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, 115 Willow St., Brooklyn 1, N.Y. Tel. ULter 2-3472 or Jackson 2-2857.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NORMany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H. & H. Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

CHESS By Ground Wave, Los Angeles. Join the Chess-Nuts-Net. Poplar 3-4924.

FOR Sale: Barker & Williamson 5100B, like new, and 515B-B, never used, with instruction books. Both \$495. Robert B. Hupper, K2PLD, 47 Willis Rd., Glen Cove, L. I., N. Y.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, National, Globe. Service all amateur equipment to factory standards. Heide Electronics, Inc., 1145 Halsted St., Chicago Heights, Ill. Tel. SKYline 5-4056.

SSBERS! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operation; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander," official publication of the SSBARA. Dues \$3.00 yearly. Write for membership application, sample "Sidebander," to SSBARA, 12 Elm St., Lynbrook, N. Y.

OSL Samples: America's finest, 25¢. Deluxe, 25¢. Religious, 25¢ (refunded). Callbooks, \$5.00. "Rus" Sakkers, W8DED, Box 218, Holland, Mich.

OSL-SWLS, 100, \$2.85 up. Samples 10¢. Griffith, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

OSL Glossy 2 and 3-colors. Attractive, distinctive, different, 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

OSL'S "Browie" W4CJL, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalogue, 25¢.

OSL-SWLS, Samples 10¢. Malgo Press, 1937 Glensdale Ave., Toledo 14, Ohio.

OSL'S New design, lower prices, fast delivery. Catalog 25¢ (coin only), refundable. Dick Crawford, K6GJM, Box 607, Whittier, Calif.

OSL'S Twenty exclusive designs in 3 colors, Rush \$3 for 100 or \$5 for 200 and get surprise of your life, 48-hour service, Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

CREATIVE OSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., KNSZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

OSL-SWLS, Samples free, W4BKT Press, 123 Main, McKenzie, Tenn.

OSLS Samples dime, Sims, 3227 Missouri Ave., St. Louis 18, Mo.

OSLS Tairnit, Union, Miss.

SUPERIOR OSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas.

OSLS, 3-color gloss, 100—\$4.50. Rutgers Varityping Service, 7 Fairfield Rd., New Brunswick, N. J.

PICTURE OSL Cards of your shack, home, etc., Made from your photograph, 1000, \$13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

OSLS WAT, Box 1, Brecksville, Ohio.

OSL'S-SWL's: That are different, colored, embossed card stock, and "Kromekote," Samples 10¢. Turner, K8AIA Box 953, Hamilton, Ohio.

GLOSSY OSLS, 100, 4 colors, \$3.50. Others less, Samples 10¢. Dick W4VXK, 1018 Arthur, Mt. Pleasant, Michigan.

OSLS, \$1.00. Riesland, Del Mar, Calif.

OSLS, Lapel pins, samples dime, Kephart W2SPV, 4309 Willis, Merchantville, N. J.

Hi, fellas! Trying to clean up a big back-log of orders. Be patient a little longer, I'll be back on faster service soon. Bob Teachout, W1FWR, 204 Adams St., Rutland, Vt.

OSLS, SWLS, XYL-OMs (sample assortment approximately 94¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, K9AAB, 737 Lincoln Ave., St. Paul 5, Minn.

DELUXE OSLS, Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

OSLS-SWLS, reasonable prices. Samples free. Robert Bull, W1BXT, Arlington, Vt.

QSL'S Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

OSLS, High quality, low prices. Fast service. Samples 10¢. Dave, 601 E. Maude, Sunnyvale, Calif.

QSL'S SWL'S Nicholas & Son Printery, P.O. Box 11184, Phoenix, Arizona.

OSLS-SWLS, 100 2-color glossy, \$3.00. QSO file cards, \$1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

OSLS: Send 25¢ (refundable) for samples, W6CMN, Schuch, 6707 Beck Ave., North Hollywood, Calif.

OSLS-SWLS, Free Samples, Spicer, 4615 Rosedale, Austin 5, Texas.

OSLS, Samples, dime. Printer, Corwith, Iowa.

OSLS, Quality and economy complete samples dime. QSL Printing, Box 12351, Houston 17, Texas.

OSLS, Reasonable, nice designs, samples dime. W2DJH Press, 31 Warren, Warrensburg, N. Y.

OSLS, Stamp brings samples, Eddie Scott, W3CSX, Fairplay, Md.

RUBBER Stamps for hams, sample impressions. Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

OSLS: Fine quality. Choose your own combination of 6 sizes, 4 card stocks, 8 ink colors, cartoons, \$2.50 up. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

OSL Special, See page 178. Hobby Print Shop, Umatilla, Fla.

OSLS, SWLS, samples 10¢. Onondaga Press, Onondaga, Mich.

C. FRITZ says, "Go West OM". So we're movin', shop and all, to Arizona. Watch for June Ham-Ad for a real deal!

OSLS, SWLS, distinctive styles. Samples 25¢. Cherney, K0MGX, 2306 "E" St., Omaha 7, Nebraska.

NIFTY, Thrifty OSLS, 10¢. Filmcrafters, Box 304, Martins Ferry, Ohio.

OSL'S (you fill in call) 100-\$1.00, 500-\$4.00, 100 samples 10¢. Back issues QST-CQ 75¢, Drexler-\$1.60. Schematics, Radio's, T.V.'s, HiFi's, \$1.00. Membership DX OSL Coop \$2.00 3 years, OSL bureau return envelope service \$1.50 yearly. (Write for free info all above.) "Coop", Box 5938, K. C. 11, Mo.

HAVE 10 top brand 6176. Will sell 2.50 each. K4LRX.

SELL: All-band transmitter, Hallicrafters HT-20. Almost completely T.V.I. suppressed; 10 through 160 meters. A.M. and C.W. with Heath VO, A-1 cond. Output 100 watts line, 135 watts C.W. \$225.00. Fred Simpson, W2AAD, Rd. 1, Box 93, Yorktown Heights, N.Y. Phone YO 2-4320.

WESTERN Radio Amateur: Third largest ham magazine in the U.S. 1 year, \$2.00; 2 years, \$3.50; 3 years, \$5.00. Also publisher "Surplus Handbook" over 90 pages schematics and photos of popular surplus receivers, transmitters, \$3.00 ppd. California, add state tax. Western Radio Amateur, 10517 Haverly St., El Monte, Calif.

CASH: For used short-wave ham receivers, transmitters and accessories. Truget, W9LVI, 2023 N. Harlem Ave., Chicago 35, Ill. Tel. TUxedo 9-6429.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, \$1.50; General, \$1.75; Extra, \$2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

ANTENNA 80-40-20-15-10. \$21.95. Patented. Latting, W4JRW, Box 44, Owensboro, Ky.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

SAVE On Electronic, Radio and Communications components and equipment for Hams and Commercial use. See thousands of parts in stock. Many more coming in daily, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse at 31st & Grays Ferry, or send for free catalog. Electronics, 1206 South Napa St., Philadelphia 46, Penna., or phone HOwARD 8-4645.

FREE Bargain list. Box 575, New York 8, N.Y.

GREAT surplus values! BC-603 Receiver New \$17.00—R-26/ARC5 Rec 3-6 mc New \$12.95, used \$7.95—R-27/ARC5 Rec 6-9 mc New \$12.95, used \$7.95—BC-639 Transceiver with PE-120 \$19.95—7-47/ART-13 Transmitters 34/AF \$49.00—Sound-Powered Dynamic Phones Pr. \$4.75—Res. Microwave R-111/APR-5 \$39.00—Collins CFI 82-Q for Q-5'er compl. w/tubes & instructions \$5.95—Collins Mod. Xformer 100 watt 111-PP to 813 final \$3.95—RA-62-C Power Supply A-C SCR-522 VHF 100 mc New \$59.50—Kite only (or above, \$17.00) Ground-plane VHF antennas 30-200 MC New \$9.95—Hi-Mu Electronics—131 Hamilton St., New Haven, Conn. Store hours 10-5, Sat. 12-5.

BOOK: Matches with your call. 50 for \$2.50. A & B Services, Box 147-C, Kittery, Maine.

TOROIDs: Unused 88 mhy like new. Dollar each. Five, \$4.00. pp. DaPaul, 101 Starview, San Francisco, Calif.

KWM1 and a few high plate dissipation tubes wanted. 304T1/TH 4-1000A, 4PR60A, etc. Ted Dames, W2KUU, 64 Grand Place, Arlington, N.Y.

TRADE: 4 string banjo and case, \$20. Johnny Dean, Box 400, Alma, Ark.

SK71 and matching R46 speaker, clean, no alterations: \$135. Heath QF1 multiplier, new, \$9.00. W2BTE, 368 Durham Court, Union, N.J.

TRAVELING: Must sell Ranger. Late model, grid-block keying, etc. Really in 1-1 physical and electronic cond. First reasonable offer. P. R. Moran, 116 Delaware, Ithaca, N.Y.

CLEAR Your shack! Send list of items you'll buy or sell. Small buyer feel, W2LMS Exchange, D'Amico, W2LMS, 319 Maryland St., Buffalo, N.Y.

COLLINS KWM-1, serial #745, mobile mounting rack, AC supply, original cartons, like new, \$735. W2BZTK, Al Mandel, 1701 Albemarle Rd., Brooklyn, N.Y.

HOMEBREWERS Attention! Guaranteed like new condx, surplus parts priced low: 807, 696; Time delay relay, \$1.19; 6H300 Ma. diode, \$1.49; 4 att 2000v. condenser, \$1.89; send for list. Will swap. W7HNV, 3113 Rocky Point Road, Bremerton, Washington.

NORTHEASTERN Ohio! Make me an offer for latest best model Hy-Gain 3-element Tribander. Steve Sclar, 240 Murwood, Charlin Falls, Ohio. Tel. CH 7-8245.

LEECE-NEVILLE 12V 50A alternator, regulator, rectifier, and cables for '57 Ford. May be used in others. Good running cond., \$49.50 F.o.b. North Easton, Mass. Eugene Buckman, c/o Robert Strid, W1RUU, 234 Washington Street.

304T1s: \$15.00; 813s and 810s, \$8.00; 3C-24s, \$2.00; Bunell or Vibroplex semi-automatic chrome keys, \$10.00 and \$12.00; Precision sig. generator, E-200C, \$40.00. W1RXE, 20 White St., South Weymouth 90, Mass.

SEVERAL Mercury wetted relays suitable for electronic bug, W. E. D 17154 or D168479 similar to W. E. 276 series, \$4.95 ea. Robert Adams, 18424 Winston, Detroit 19, Mich. Tel. KE 7-0931.

KP-81 Pierson Communication rcvr instrum manual urgently needed. Borrow, buy or rent. W2ZMM.

CRYSTALS Airmail: SSB, MARS, Novice, Commercial, Net, etc. FT-243, 0.01% any kilohertz 3500 to 8600, \$1.49 (10 or more, 99¢), all Novice, 99¢; 1700 to 30,000, \$1.95. All frequencies 60¢ additional for HC-5/U hermetic holders. Builders crystal packages. Novice, Novice QST, "Phasing Sidebands", \$9.95; Novice, Novice CO "Crystal Synthesizer" 31 crystals, \$39.95, hermetics, \$12.95, matched filter, \$6.90; Collins hermetics, etc. If you don't see it be specific, write! Airmailing 9¢ per crystal. C-W Crystals, 206SQ El Monte, Calif.

SELL Johnson Courier, \$220.00; Jennn's Vacuum capacitor UCS 10-375 a5fd, 10,000v., \$35.00; Prop pitch motor selcyns indicator, \$3.45; 4-125as, \$2.00. W7PSO, 3740 Alpine, Casper, Wyoming.

AR-3, cabinet, manual, \$20.00. K3EVT, Zelienople, Penna.

SELL: Globe Scout 90, in excellent cond., FB reports all bands. Throw in spare 807s, \$45.00. Phil Castelli, Harrison, N.Y.

75A3, \$150.00; HT32, \$475.00 or both for \$800.00. K4LGP, 1008 Mendenhall Street, Thomasville, N.C.

SELL: Viking Vallant, exc. condx. Factory wired. Purchased early in 1958, used sparingly. Real cool rig. \$340.00 F.o.b. Mail check. Will ship. Phil Girard, W8GRN, 14025 Norborne, Detroit 39, Mich.

TRADE: Bensen, Gyroglider, sud condx, test flown, value \$400.00. Desire ham gear, linear, power supply, etc. of equal value. Box 7177, Apex Station, Washington, D.C.

HEATH Mohawk, Eico 90W c.w. xmtr, Knight VFO. All equipment new, tested, calibrated. Not used! \$300 plus shipping costs. Collector, senior EE major needs money for school. Hal Cook, Box 2024, University Station, Gainesville, Fla.

HQ-160 with matching speaker, in perfect condition, asking \$275. Stan Symons, 32 Glenwood Ave., Poughkeepsie, N.Y. Tel. GR 1-6792.

WANTED: QST for December 1916, January 1917, February 1917, May 1917 and September 1917. E. Laird Campbell, Box 1, West Hartford 7, Conn.

JOHNSON KW, desk, Pacemaker, audio amp., power divider, 75A4 receiver. Cost over \$2800. Will sell all for \$1900. W4LKP, Bowling Green, Virginia.

WANTED: Johnson Kilowatt, K9KFK, Route 2, Shelbyville, Ind. ana.

SELL 40 ft. steel tower, tilt base, newly painted, \$50.00. G. Grey, W2LOC, 29 Elmwood Rd., Cedar Grove, N.J. Tel. CE 9 3598.

IS \$485 too high for my factory-wired Thunderbolt? Make me a serious offer and I'll reply promptly. Weight is 120 pounds, so it's best to pick it up in your car. L. A. Morrow, W1VW, 99 Bentwood Road, West Hartford 7, Conn. Phone ADams 2 2073.

PRINTED Circuit, transistorized, audio oscillator. High and low 1 Kc. outputs. Info on request, \$10.95 less battery. Werlatone Engineering, Box 386, Katonah, N.Y.

SELL Collins 75A-2, w/spkr, xtal calibrator, product detector, in exc. cond., \$315. Like new SS-75 exciter, \$95; Heathkit FM-3A w/tuning eye and BC-1, total, \$49; Heathkit 25 watt VSW amplifier and WA-P2 prcgrm. \$69. A. W. Porsch, W3-NFT, W. Main Rd. 4, Brookville, Penna.

VIKING II, factory-wired and Heath VFO, \$200. Joe Marso, K2JVE, WRC Home, Oxford, N.Y.

SURPLUS Mail Auction! Meters, relays, transformers, tubes, etc. Catalogs describing each lot, 50¢; refundable toward first bid in any of our auctions. Each lot sold to highest bidder. No reserve. A nickel can steal a lot! Jabour Electronics, 20 Woodbine St., Pawtucket, R.I.

BC611B Handi-Talkie, two excellent units. No reasonable offer refused. J. Zach, 905 Douglas, Endwell, N.Y.

HALICRAFTERS Receiver SX-24, just factory aligned. Has crystal phasing. Price \$60. K2KJL, 135-30 232 St., Springfield Gardens 13, L.I., N.Y.

GONSET 2 meter converter, 200; noise clipper, \$5.00; NC-300 rcvr, \$225; NC300 2 meter converter, \$25. W2HNI, 135-30 232nd St., Springfield Gardens, L.I., N.Y.

HY-GAIN 10-15 20 meter ground plane with radials and base, \$18.00. W2VTD, 135-30 232nd St., Springfield Gardens 13, L.I., N.Y.

GENERAL License theory course will be offered in Jamaica, L.I. Area to all interested Amateurs with Novice licenses or Coaxial cables. W2HNG, S. Schackel, 135-30 232nd St., Springfield Gardens, L.I., N.Y.

FOR Sale: SX-100, perfect, no scratches, no instability, clean, complete with new R46B matching speaker, \$200; practically new, SX99, no scratches, perfect, \$110.00; G-E new 14 volt 15/1030 volt 215/260 Ma. dynamotor, \$20; ART-13 mike, interstage and 811A modulation transformer with 811As, \$20. Complete parts for 813 final RF pl-net output, \$20. Neill A. Jennings, P.O. Box 7152, Greensboro, N.C.

HALICRAFTERS SX-88, their best \$35 Kc., 33 Mc continuous, 20 tubes, double conversion, 100 Kc. calibration AM, SSB, CW, etc. \$395. W2DITD.

FAST Service, send stamp for QSL samples, K2 Presa, Box 372, Mincola, L.I., N.Y.

SELL: Gonset G66B receiver, like new, universal power pack, 6.12VDC, 115VAC, \$185. Jim Mortensen, Woodbrook Gardens, Irlington, N.Y. Tel. LY 1-9050.

COLLINS 32V3, in sud condx, best offer. All letters will be answered. T. J. Rezan, W1WEM, Hotchkiss Grove Rd., Branford, Conn.

SELL: Globe Chief 90, factory-wired UM-1, \$60; 300 watt homophones, 811 modulators, 811 modulators, 811 modulators, 2-2300/1600 volt xfmr's, both S.S. Craig, and, K1GDN, North Saco, Me.

COMPLETE Mobile station Elmac AF-67, Gonset G66B, Master Mobile Mount, Mosley Tri-band vertical, two power supplies, three relays, five co-ax condensers, push-to-talk mike, control panel, etc. \$350.00. Dick, K2OUC, 25 Woodbine Circle, New Providence, N.J.

SALE: Johnson TR switch 250-39; P&H compressor amplifier AC-3, Tri-band Skyline cubical quad, K5OMQ, Box 725, Roswell, N.M.

FOR Sale: KWM-1 #428, AC and DC supplies, 312B-1 spkr, 505-C mike, mobile tray, three Helihops, antenna mount, \$90.00. Or trade for excellent KWS-1; Central Electronics 6001, excellent \$350; Elmac 5A4H, \$65; P&H "VFO-Matic" model 80-20, \$75; BC221A, \$65; transformer, 115 volt, 3100VCT at 400 Ma., \$17.00. Matching choke, 9 hy. at 500 Ma., \$0.00; \$12.00. James Craigs, 172 West Third, Peru, Ind. Tel. CR 3-9305.

\$495: SX-99, \$109; SX-101, \$225; SX-101A, \$295; NC-183-D, \$239; HT-32A, \$519. Gonset III 6 meters, \$219. GSB-100, \$399; Technical Materiel PMO oscillator, counter dial, \$245; Teletype Printers, #14, #15, #19, #26, #28, #1-D #14, #14 Kenner, contact Write Tom, W1AFY, Allentown-Howard Co., Box 19, Boston 1, Mass. (Richmond 2 0048).

WANTED: Old QSTs and Handbooks. Must be reasonable. Am building library, not speculating. Cash, or swap ham-gear. W0FIR.

TOO Late now to save on the early bird prices for the New England Divisional Convention, Sunday, May 1st, at the New Ocean House Hotel, Swampscott, Mass., but you can get a ticket at the door for only \$3.50 and the banquet is \$5.00 if not sold out. Manufacturers' and distributors' exhibits of the latest gear. Talks, contests and all the trimmings. Ask the ham who was at Swampscott last year.

NATIONAL H.F.S. coils, power supply, \$70; Mosley vertical, new, model V-46, \$20; Globe Scout 65, \$45.00; JT-30 mike, \$5.00; Hammarlund spkr, \$5.00. Danner, 845 So. 29th St., Omaha, Nebr.

SX-101, \$295.00; Heath kit DX-100, \$150; CBI Citizens Band transceiver, \$48; VX-1 voice control, \$20; Comanche MR Cheyenne MTI, MF-1 power supply, spkr, base, mount, all like new, \$285; Regency ATCI converter and TCR28 receiver, like new, \$85. M. D. Welch, 2637 49th SW, Seattle 16, Washington. Tel. WE 7-3784.

SELLING: Hallicrafters SX-100 Mark II, Morrow CM-1 Conclard rcvr; Bendix DA-15 dynamotor, Ameco Senior code course, 3-speed player, Bud code osc., International xtal FVC-2 50 Mc converter, Bud C1551 cabinet, Premier R3619 rack, 1 each xfrms, UIC S19, S33, S34, S46, S67; Merit P2946, P2956, A3008, C2974, C3183; Stancor C1001, Traid A31X, 1 cm Simpson 1227 DCMA meters 0-1, 0-10, 0-100, 2 each Aerovox JP09 4 1/2 1500 VDC, 10 1/2 1000 VDC; 100 assist tubes. Also have assist ham gear, 1st. Best offer takes all or part. Cash only. Bart B. Bonney, 2310 Baynard Blvd., Wilmington 2, Delaware.

FOR Sale: DX-100 and D-104 rigged push-to-talk. Best offer. W. C. Hicks, Box 144, Lanett, Ala.

FOR Sale: Instructograph, Standard AC model, complete with code tapes, phones, key and instructions. Excellent condition. Reasonable. D. H. Harter, 82-42 Kew Gardens Rd., Kew Gardens 15, N. Y. Tel. NYC 80-39066.

COLLINS 75S-1, like new, \$425; HT-32 perf. condx with Johnson T.R. Switch, 475, Gonset Twins code supply, power supply and G-77 with 2-way power supply modulator, both only \$365. R. K. Pond, Jr., 1607 Singleton, Wichita Falls, Texas.

SELL: SX-110 w/spkr, 3 months old. \$125.00. Aramburu, 80-20 Broadway, Elmhurst 73, L. I. N. Y.

SELL: Motorola FMT30D-12 volt mobile transmitters 30-45 Mc., \$12.50 each. Villers, Box 1, Steubenville, Ohio.

SELL: Need money for school, 6-meter walkie-talkie as in January 1955 CQ. Best offer. Braunstein, KNOYOM, 8155 Stanford, University City 30, Mo.

SQUELCH Adapter. Send \$1.00 for schematic and instructions for carrier-operated squelch circuit—adaptable to any set—ideal for Command sets; low, medium and VHF—also other new and surplus receivers. Kit of parts available at nominal cost. Aviation Radio, Inc., Box 2746, Oklahoma City, Okla.

LEARN Code. Qualify for Amateur or Commercial Licenses. Free book, Candell Dept. Q-5, Box 9226, Denver 20, Colo.

FOR Sale: HRO5TI with coils set A, B, C and D plus speaker. Inquire J. Bolens, 30 West 86th St., New York, N. Y. Tel. EDnicott 2-3325.

SELL: Good Heath AR-3 with cabinet, \$28.00. K7HEU, Rte. 1, Box 48, Ritzville, Washington.

SALE: 500W SSB Transmitter, GSB-100, HQ-170, factory wired Courier, \$800. Purchased new July 1959. Address inquiries to Albright College, Reading, Penna. K2GYY, Philip Marsulies, 9 Pine Court, Westfield, N. J.

FOR Sale: Two brand new Hammarlund receivers: (1) HQ-160, \$330; (2) HQ-180C, \$385; both are in original condition with instruction book and warranty cards. First money-order or cashier's check receives. John H. Ashley, WA0SC, Ware Shoals, S. C.

K2HA moving all items half price: Communicator BW-SSB-KW, write for list. Gillette, 39-39 223rd St., Bayside, L. I., N. Y.

WANTED: Heathkit audio oscillator Model AG7. State price and condition. Doug Morris, 3006 Miller Road, Flint 3, Mich.

FOR Sale: Slightly used Heathkit DX40 trans and balon coils, \$60.00. KN8LRE, 423 East 44th St., Delphos, Ohio.

SELL: Collins TS-A4 with 800 cy. and 3 Kc. filters, Vernier dial and spkr, serial 3165 original carton, \$620; B&W 5100B with 515B, T.R. Switch, D-104 mike, \$580. Harvey-Wells Z-matched, \$50. Gene Rhodes, WF4NY, Box 3386, Savannah, Ga.

KAQNJ and KAYMS have had their licenses suspended. Will sell the following items: HT-37, \$350; HT-33, \$350; HQ170, \$385; HQ110, \$35; Globe King 4001 with coils for 10-20, 40-80, \$235; Elmac A-54 with Elmac 115 volt power supply, \$75; PMR7 with PSR6-12 power supply, \$150; Jackson Model 652 audio generator, \$15. All the above items are in perfect operating condition and appearance. The following for local sale only: 40 ft. galvanized tower, Hy-Gain Tribander, CDR rotor TR4, R8GU complete, \$100. Also, numerous home brew equipment such as power supplies, modulators, finals, mobile equipment and meters. Herzog, 4861 Shady Grove Rd., Memphis, Tennessee.

SACRIFIC mint condx NC-300, used 100 hrs w/calib. \$235 cash. Exc. DX-100 unmodified, \$145. Clean Matchbox, \$30. Near new Ham-M rotor, \$95. K6CTV, 1780 American Ave., Pomona, Calif.

SELL OR swap for gnd Communications rcvr: Globe Champion 300A, factory-wired, in new condition, \$1. To highest offer. W0RJB, Ben Sandberg, 932 N. Westbourne Dr., Los Angeles 46, Calif.

FOR Sale: DX40, Knight VFO, JT30 mike, Heath S.W.R. bridge. In exc. condx, all for \$105.00. F.O.B. K8KSJ/8, 808 1/2 E. Bay St., E. Tawas, Mich.

SELL: TBS-50C trans, 30 watt Multi-Match mod. tr. Drake QXer, 20 watt amp, with 15" spkr. Pole transformer for 2200 V., 60 800 Ma. MD-7 Mtns B&W T.R. Switch, Many meters and older rcv. tubes. Misc. equipment. Want: 250 or 4-400 tube. Free list. W0ZOB, Hansen, Box 273, Coleraine, Minnesota.

GSB-100 and HQ-170-C. Practically brand new. Original cartons. First check for \$650 buys. Only on air few hours. Claude Goodman, Jr., W5KWC, 1803 S. Marsalis, Dallas, Texas.

PHASING Sideband, original model as in November 1959 QST, in exc. condx, \$150. A. Kelley, 2307 S. Clark Ave., Tampa 9, Fla.

GPR-90 Serial #1771, \$300. William Johnson, 25-07 35 Ave., Long Island City 6, N. Y.

BOUGHT A large lot of surplus transistors and diodes to set the ones I wanted. It was more than a college student can afford so I'm selling out. Texas Instruments 2N342 silicon 3/4 watt transistor, 35¢; 1N1905 silicon 500 volt power diode, 30¢. 1N34A, 10¢. Also other odds & ends. Bob Wilson, W9RNL/0, Box 70, Forest View, Iowa City, Iowa.

WANTED: Augustor, September, November 1958; January 1959 Bulletin R5GB. Elmore Fitz, Box 85, Lanesboro, Mass.

MUST Sell: One DX-100, in rud condx. Best offer over \$125.00. John Yeager, W8CDJ, 1119 Chestnut Rd., Ann Arbor, Mich. DX100B, excellent condx. \$175. K1KRO, 88 Somerset Rd., Glastonbury, Conn. Tel. ME 3-9243.

BARGAIN: Complete set-up for DX. 40' Televue crank-up tower, Full size 3-el. beam, ten meter T-match, balun tuned 28.8 Mc, 67 R8GU, Alliance rotator, 75 ft. control wire. All rigged. Need the cash. First \$55.00 takes it. Sry, no shipping! Carl Lane, W2ZGD, Somerset, Mass.

SELL: S27C rcvr, 120-240 Mc. AM/FM, \$36 rcvr, 27-143 Mc. AM/FM; BC 679 part, with PS and 10 M band, 4X250B, 4CX300A, 4-250A, 4-125A, 6161, 4CX250K, 4E27A tubes; Tectronix 511 scope; 1000 Kc. xtal, Subroc mobile, 40W xmr, Gonset Triband converter, 100W. Bendix 4-band xmr, Model ATD, voice, 100W power supply, w/r/mole control operation, 21 in. West, TV, new pix tube, RCA 15 in. color TV set, Cy Harris, W2NDR, 758 Princeton, Franklin Sq., N. Y. Tel. WHooe 1-4320.

WANTED: A.C. power supply for ART-13 xmr (1250-1500 VDC at 300 Ma); 400 VDC at 250 Ma and 67 VDC at 10 amps). Prefer with panel and cabinet. No junk. Best price in first letter. John H. Ashley, WA0SC, Ware Shoals, S. C.

HQ100C and VHF 152A for sale, both \$180. K. Olinger, W4JFV, Thurmond Dr., Cincinnati, O.

QSTs wanted: Apr 1952 through 1956. All years before 1942. ARRL Handbook 1949 through 1959. Bill Baker, Rte. 2, Troutdale, Oregon.

TBY. New, with ant., knapsack, mic., headset, tubes, two vibrator supplies, less batteries. Will swap for BC-348. Rich Merwin, WA2AQ, Pumpkin Lane, Staatsburg, N. Y.

FOR Sale: Heterodyne frequency meter, range 125 to 20,000 Kc. Type CRR 7402B. Built by Bendix Radio. Complete with power supply, \$60.00 cash. F.O.B. Chicago. Walter Kuehl, 6647 Kenton, Lincolnwood, Ill. Send for photograph!

GONSET SSB transmitter: GSB-100 Model 3233, new, in perfect condx. Need money for school. Best offer! K9CPW, 5037 Olympia, Chicago 31, Ill.

SELLING: Good NC-300 with speaker and 100 Kc calibrator. Will be willing to ship collect in original cartons. \$299. W0LBS, Kenneth Binsler, 1300 Oakland Road, N.E., Apt. 1319, Cedar Rapids, Iowa.

SWAP entire HQ gauge model railroad for Gonset or Gonset mobile receiver. Send for list. K4TIW, 26 Peachtree Gardens, Barnwell, S. C.

WANTED: Radio receiver AN/URR-13A-MSARAN or URR-35 or 35A. Must be in A-1 condition. Also Premier xtal controlled signal generator Model 117. A. H. Glines, 46 Winter St., Quincy 69, Mass.

COLLINS 32V3, excellent condition, \$375. No shipping. New York City area. W2AEB.

TRADE: ART-22 TV camera and companion 110W, 420 Mc transmitter. Both brand new! \$280 value. Want 75A2, WA2GJT.

FOR Sale: Ham Dream, 1958 Thunderbird, KWM1. Thunderbird fully equipped, rig fully debugged. Mosley Tribander, complete, \$4000. J. R. Popkin-Clurman, W2LNP, 28 Ranick Dr., Amityville, N. Y. Phones Lincoln 1-3600 and Mayfair 6-1584.

COLLINS KWM-1 serial #745, mobile mounting rack, AC supply, original cartons, like new, \$735. WAZBK1, Al Mandel, 1701 Albermarle Road, Brooklyn, N. Y.

WORLD'S Finest reconditioned equipment at lower prices. On trial. Trades. World's best terms financed by us. S-38, \$29.00; S-31A, \$59.00; SX-99, \$119.00; SX-96, \$159.00; SX-100, \$199.00; SX-101, \$279.00; HT-32, \$479.00; HQ-100, \$129.00; NC-37, \$59.00; NC-138D, \$225.00; NC-300, \$249.00; Globe Scout, \$59.00 Vikings II, \$179.00; 75A-4, \$549.00; KWM-1, \$595.00. Hundreds of other items. Write for list. Henry Radio, Butler, Mo.

WANTED: Elmac AF-67. Gud working condx. Reasonable price. R. Wilton, 4 Liana St., Woburn, Mass.

COMPLETE 12 volt mobile station for sale: Gonset G66, bandswitching 50 w/v, antenna and PE-101, \$180. Also Scout 65A and Heath VF-1, \$80. D. Anderson, P.O. Box 437, Hia-washta, Iowa.

WANTED: National, SW-3 receiver with 80-40-20 meter coils, W3BC, Nordmark, 1000 Ehler St., Stroudsburg, Penna.

SELL: Viking Challenger, WRL 755A VFO and homebrew 6 meter VFO. All for \$170. In excellent working order. Challenger includes push-to-talk and latest improvement modification. Ernie, K1DRX, 42 Brookside Rd., Bedford, Mass.

SELL: Modulator for high-power rig. Commercially-built, min. 350 watts audio output. Thordarson xfrms throughout, speech compression and clipping. Will include pair mod. tubes and \$30.00 modulation percentage meter. Never used. \$54.00. Free info sheet. WA4CXQ, Box 3161, Blacksburg, Va.

WANTED: Coils A, C, and D for HRO-5 General Coverage or Bandsread, W2WBI, White, 118 Cedar Lane, Princeton, N. J.

COMPLETE Station Ranser Super Pro necessary extrals. Best offer over \$300. Send stamp for list. W8YOG, 414 Northside, Toledo 12, Ohio.

FOR Sale: GSB-110. Excellent condition. Latest factory modifications. Approximately 100 hours use. First offer over \$400.00. Also Collins 32V-3. Excellent condition. All new tubes. \$400.00. Both F.O.B. Belvidere, Bill Pruitt, W9VBU, Belvidere, Ill.

SELL: S-53A, \$70, best offer, or swap for Gonset Commander. WAZQW, 143 Ridgewood, Glen Ridge, N. J.

FOR Sale: Collins TCS-12 xmt, with AC power supply, built in VFO 1.5-12 Mcs. 70 watts fno 80 c.w., relays and mic. \$75. S-38E recvr with QF-1 Q-mulit, and AC pwr. supp. \$45. Joel Herbman, WA2GZD, 1510 Unionport Rd., Bronx 62, New York 10. Tel. MAdison 2-7215.

ENJOY Solving technical problems for customers? Here's a real opportunity for young technical personnel to serve as customer correspondents. Electro-Voice, leading manufacturer of high-fidelity speakers, phonograph cartridges, microphones, public address and communications equipment and marine instruments, has immediate openings for customer service personnel. Good men can look forward to a career with growing responsibility. This is the ideal time to join a young aggressive company and a congenial team. Live and work in a small town in Southwestern Michigan or live in South Bend, Indiana, fifteen miles away. Paid vacations, hospitalization, life insurance, pension plan, and other benefits. Send full details including photograph and salary requirements to Lawrence LeKashman, vice-president, marketing, Electro-Voice, Buchanan, Michigan.

WANTED: Collins 32V3, Collins KW1 or KWS1, also rotor and Tri-band beam. Must be in exc. condx. Randall Muncy, 4375 National Rd., Springfield, Ohio.

I.R.E. Proceedings: \$45.00 for complete run of August 1947 through 1959. In exc. condx. Shipped collect. William Boyer, W3AMQ, 127 N. Oxford St., York, Penna.

SELL: National NC101X, \$50.00; Hammarlund HQ120X, \$90. Stanley Yael, 366 Brooklyn Street, Sharon, Penna.

HAM Magazine subscriptions: W6LKI, (Tatum), 1451 Raymond Ave., Glendale, Calif.

SELL: KWS-1 extra good condition. Hy-Gain Tri-band beam with 100 feet RD8U. Heathkit QF1 built, never used. Heathkit AM2, New 4D32. Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

HQ-129X, \$115; Viking II, \$175; Heath TS-4A sweep signal generator, \$50. All in excellent condition. John Cobb, 620 W. 5th Ave., Albany, Oregon.

SELL: SX-100, less speaker, \$175; Viking II with BC459, \$175; 5 months old Gonset GSB100, \$400. Al Rae, 5 Oakbrook Road, Ossining, N. Y.

ALUMINUM for every Ham need: Write to Dick's, 62 Cherry Avenue, Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

WANTED: National HFS or NC-110 revr. K2ARO, 112 Croton Ave., Ossining, N. Y.

HEY Old Timers! Who has any issues of the Electrical Experimenter magazine for the 1913-1915, 1919 period? Please quote postpaid. L. I. Anderson, 1615 East River Terrace, Minneapolis 14, Minn.

B&W 5100B & B&W 51SB-B. Late run 2 with all manuals; GSB-101. Line like new. Robert A. Smith, WILLF, 320 Bushy Hill Road, Simsbury, Conn.

RECONDITIONED! Terms! Trials! Full Guarantee: Specify 6 or 12 volt on mobile equipment. Elmac PMR-6 \$79.00; Hallcrafters SX-7 \$155.00; Hallcrafters SX-9 \$119.00; Harvey-Wells R-9 \$99.50; Heath Commanche \$139.00; National NC-98 \$109.00; National NC-183D \$229.50; National NC-300 \$249.50; Pierson KE-93 \$179.50; Sonar MR-3 \$35.00; Gonset Super 6 \$39.50; Morrow SBR-2 \$45.00; Remco ATC-1 \$59.50; late KWM-1 \$699.50; Elmac A-54 \$95.00; Elmac AF-67 \$139.00; Champ 300-A \$369.00; Hallcrafters HT-32 \$525.00; HT-33 \$449.00; Heath Cheyenne \$129.00; Johnson Ranger \$210.00; Johnson Pacemaker SPECIAL \$369.00; Palco 65 \$119.00; Sonar SRT-120 \$75.00; James C-1050 \$35.00; Telecomm-2D11 \$49.50. LEO, WOGFO, Box 811, Council Bluffs, Iowa—World Radio Laboratories.

SELL: Globe King 500-B with 4-400 final used on SSB and AM, \$550; E-170C with matching speaker, \$300. Will deliver in Ohio area. Forrest E. Hotham, W8OVJ, Box 128, Coshocton, Ohio.

SELL: 2 M Communicator III, \$209. Dimmer, 2233 Cypress St., Waukegan, N. Y.

WANTED: Transformer 1500V. CT at 300 Ma or power supply 750V at 300 Ma (output) also AR-3, \$25.00 for sale. WA2DKY, O'Connor, 1745 Amherst, Buffalo 14, N. Y.

BRUSH Soundmirror tape recorder, \$50; Garrard record-changer, Pickering cartridge, \$25; GE model 505 portable radio, metal case, new battery, tubes, \$25; UTC PVM-4 modulation transformer, unused \$10. 2-station intercom, \$10. V. R. Hein, 418 Gregory, Rockford, Ill.

SELL: SX-100 Hallcrafters receiver. Excellent appearance and condx. Need cash. Best offer over \$145. Vannewick, 654 Freeman St., Orange, N. J.

CANADIANS! Gonset Communicator III, 5 stals, two tentement, two mtrs, with rotator, 1000 watt feedline, all new, only used a short time. Write: VE3EGG, 64 Barrie, Galt, Ont., Canada.

SELL: 4-1000As, \$45.00; 4-125As, \$12.50. KØBIT, 5331 Oaklawn Ave., Minneapolis, Minn.

SELL: QSTs January 1934 to December 1959, 26 years complete run. v. y. aud condx. not defaced. Make best offer. Louis Kries, 14 Western Blvd., Gloversville, N. Y.

WANTED: SX62A, predecessor or equivalent. State price and condition. Harvey Wheeler, 406 Jackson, Lexington, Va.

MOBILE Rig: PMR6A and #54H custom under dash rack for 1958 Chev. James C1050 supply, Masier Mobile Mounts antenna for 75, 40 and 10, with all cables. \$170. W8LYZ, P.O. Box 150, Midland, Mich.

RADIO May 1936 to April 1941, complete run plus July 1941. Best offer, W2JKH, 392 Lafayette Ave., Westwood, N. J. Henry G. Elwell, Jr.

FOR Sale: Viking I, TVI suppressed, new front panel, Johnson low-pass filter, spare 4D32, \$135; Johnson 122 VFO, \$20; two 4C300 sockets, \$10 each; two unused 2C39B \$15 each. Ralph J. Roode, K3JDX, 208 Quaker Ridge Road, Timonium, Md.

SELL: SX-100 w/spkr, 3 months old, \$125. Aramburu, 80-20 Broadway, Elmhurst 73, L.I., N.Y.

FOR Sale: National NC-125 receiver in excellent condx. \$110. W4QCW.

MUST Sell ham station, perfect condx: DX-100 w/mike, Vibroplex bug, \$140; NC-98 w/spkr, Q multiplier, Re-selector, \$110. Will sell everything, ant. coupler included, for \$250.00. Write to Glenn Krueger, W9TXU, 8240 Emerald Ave., Chicago 20, Ill.

SELL: Two meter Communicator II, Gonset VFO Preamp, S-5 Telrex beams, CDR rotor, \$195. Peter Brandenberg, K2MMT, 130 Pelham Rd., New Rochelle, N.Y.

COMMUNICATOR III, 2-mtr. with seven stals, mike and Telrex 2M-6C (unused) beam, \$225; B&W 651 Matchmaster, \$29; Morrow CM-1 Conelrad Monitor, \$24. W3BRS, RFD 2, Taneystown, Md.

SELL: BC348, excellent, 115VAC operation. \$50. BC375E, \$15; Selsyn beam rotor, new, \$30; PE73C dynamotor, \$5; Sideband exciter, \$25. W6HHN, 3467 Rainbow Dr., Palo Alto, Calif.

FOR Sale: Hallcrafters S-85 receiver. Good condx. Will ship. First \$75 takes it. Details available from Frank Hunserford, Glasgow, West Virginia.

CENTRAL Electronics 20A SSB exciter, like new condx, inc. BC458, ECO converted, \$229.50. W4JSH, P.O. Box 1212, Lexington, Ky.

MUST Sell: HQ-110, new. Best offer. Les Shapiro, 129 Miles Ave., White Plains, N.Y. Tel. WH 9-6537.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

KWM-1 with Collins 12V DC supply (never used); 115V AC supply, directional wattmeter 302C-1 with coupler, and cable for mobile installation (also never used). All for \$900.00. J. E. Stanly, K1GAP, 35 Joseph Road, Framingham, Mass. Tel. TRinity 5-0209. Business phone: Boston, Mass. COpley 7-6600, Ext. 247.

KWS-1, #1225, 754A, #4427. Actual operating time less than 27 hours. "Original owner" guaranteed like new, in mint condx. now operating. Will sacrifice complete station for \$1595.00. Would consider KWM-1 in trade. Bob Hamlin, 4303 Kroes Rd., Rockford, Mich.

FOR Sale: Apache, 1 year old. Latest Heath modifications like new condx. Local deal preferred: \$235.00. Also: Johnson Match-box 275 watt 250-23, new, \$35.00. W2UM, Paul Todd, Box 265, Somerville, New Jersey. Tel. RAndolph 5-4832.

SALE: CE Model B Slicer, \$49.00; Heath CA-1 Conelrad, \$9.00, both brand new, never used. Olmick, W3PVC, 300 Third Ave., Burnham, Penna.

SELL Or trade: Precision ES500 'scope; E406 sweep gen., Simpson 415 sig. gen., Sylvania 140 tube tester, Stancor 132 power pack. All are in excellent condx. \$250.00 or accept new Heathkit Apache xmt kit in trade. W1KK1, P.O. Box 209, Milton, N.H.

SELL: KWS-1 PTO. Collins 70E-23, no dial, \$35.00; New Collins 3 Kc. mechanical filter for 75A4, \$45.00; Bonton micro-rotor, needs repair, \$49.95. Gene, W9ERU, Box 273, R.R. 4, Rockford, Ill.

FOR Trade only! KW Class 4A-250A amplifier; power supply, heavy duty, output 2500 volts at 400 Ma., screen and bias supplies; power supply, output 2000 volts at 500 Ma., 4-250A tubes; Milton 9071 VFO. Will trade for anything in trade. Do not want radio equipment. What do you have in trade? G. Landfield, 821 Waveland Rd., Lake Forest, Ill.

75A4. For Sale. New 3 months ago, 3 filters. First \$600 check gets this perfect jewel. E. H. Buckley, P. O. Box 706, Hartsville, Ala.

WANTED: Tech manual TM-11-896 for R270/FRR recvr. W. Jackson, WA1LZ, Box 51, Savannah, Tenn.

GLAS-LINE. Eliminates glass "Break-Up" insulators. \$3.08/100 ft. f.o.b. NYC. VHF xmt, for 2 m. or 1/4 m. conversion. Late modern design. Two 6D81s into 6360; batt. pack (water-activated), cable, schematic, conversion info. Xmt 3/4 lbs. battery 35 lbs. \$15.00. Plastic raised relief maps. Framed for hangings. 28 1/2 x 28 1/2. Specify USA or World. Only \$9.95 ea. Cash paid for unused tubes. 304TL, 304TL, 2C39A, 833A, etc. Get catalog ham special today. 25¢ to Barry's Green Sheet, Westinghouse, etc. Barry Electronics, Dept. Q-5, 512 B'way, N.Y. 12, N. Y.

SX-42, FB, \$80, SX-28, needs wk. \$20; BC221 w/mod. no bk. \$20; RDZ (UHF rec) \$17; SCRS22, \$20; APX-6 \$10. More free list. K6AHX, 1313 Luneta Dr., Del Mar, Calif.

CANADA: Well established sales and service business: Ham, TV, Radio, Marine, on Vancouver Island. Main street location. Operated by well known D. and V.E. Hest. Complete test equipment, tools, stock and service auto. Selling for health reasons. Great opportunity at \$8000. Write Gordon Hulme, Ltd., Sidney, Br. Col., Can.

WANTED: Collins 800 cycle mechanical filter F455B. Must be "B" for early 75A-3 receiver. W2MW, 44 Wilber Terr., Bloomfield, N. J.

WANTED: Names and addresses of blind (or TV) servicemen. Purpose: to find out how they mastered their trade and assist the sightless to enter the electronics field. M. J. Chriwell, Ed. D. (W2RUN), 95 Portland St., Buffalo 20, N. Y.

SELL: Collins 32V2, \$225; constructed operational Heathkit SB10A Sideband adapter with pwr. supp., \$90. New York City area. Tel. 3-667, 6-8 PM or K2BOB, 3101 Healy Ave., Fair Rockaway 91, N. Y.

WANTED: Collins 511 series receiver for sale—Hallcrafters SX-100, \$200, Robert Ireland, Pleasant Valley, N.Y.

NC-88 Revcr, several years old, untouched 2 years while in service; excellent cond. Reason for sale: Moving. Best offer, Dick Weeden, W2IKF, Box 40, School St., R.D. #2, Nixon, N.J.

HQ-170 used three months, \$275; 4-1000A, \$35; 1.2 Kw new var-match modulation xfrmr. make offer. Most new parts QST Kw linear, 813s and power supply, \$95. 110 volt coax antenna relay, \$60. Send for additional parts list: Don Cordray, 6803 Admiralty Ave., Van Nuys, Calif. Tel. Dickens 4-1736.

FOR Sale: 20A F/W QT-1, PAH amplifier, model 400B, F/W, and BC458 VFO = 500 watts SSB, all like new, \$340 or best offer. K5MWU, QTR, 1831B, Blitviteh AFB, Ark.

WILL Sell or trade: Navy surplus TBM-9 transmitter with plate modulator. One Kw input. Top cond. Make offer! Pacific Amateur Radio Club, 1020 Pacific Ave., San Bernardino, Calif.

SELECT-O-JECT (National) adjustable T-notch audio filter. Ideal for use with Drake 1-A or any revcr to reject heterodyne or sharpen CW reception, \$17.50. Knight antenna impedance bridge, \$5.00. C. Brooner, P.O. Box 261, Morton, Ill.

20-A, with QT-1, Deluxe CE 458 VFO with CE 10 meter conversion, and complete manual, \$205; GG band-switching linear, with 4-6AC7s, and 800 volt supply on same chassis, \$80. Both for \$270. Kenyon multi-amp Class B input and 12 watt modulation xfrms, \$15 the pair. Cash and carry, George Ruliff, W2CJY, 38 Brookwald Drive, Manhasset, L.I., N.Y. Tel. MA-7-0407.

MOBILE 80-meter, 17-watt transmitter and receiver, BC-654 A, complete with cables, both power supplies, mike-phone set, antenna, all spares, diagrams, \$65.00. T. Stansbury, 4871 Battery Lane, Bethesda, Md.

SX-101 Mark III and Johnson Ranger for sale. Both perfect. Best offer. Contact K1E11.

SELL: Apache, wind maintained, operated by holder first time. Latest circuit, \$265.00, Jerry, WA2FPN, Tel. GE 4-5431, 763 Ocean Pkwy., Brooklyn 30, N.Y.

PA-400SSB "Elenco" linear power amplifier. Cost \$275 and used about eight hours. Consider trade for late receiver, camera or cash offer. W1RMS, 198 Euclid Ave., Waterbury 10, Conn.

QST 1926 thru 1945, run bound. Best offer, cash carry, W2AEB.

HAMFEST June 5th Southwest from Ottawa, Illinois, on Illinois State Rte. 71 at the LaSalle County 4-H Home and Picnic Area. Same place as last year. Advance registration accepted if in our hands before May 25th. Advance registration \$1.00; at the gate, \$1.50. Sponsored by the Starved Rock Radio Club. For info, contact WYMKX, G. E. Keith, Sec'y, RFD #1, Box 171, Odesley, Ill.

JOHNSON Ranger, \$165 F.o.b. QTH. First certified check gets excellent rig. Jim Hairgrove, 502 Magnolia St., Lake Jackson, Texas, W5MXK.

VIKING I and VFO, time sequence keying, \$140. F.o.b. Westwood, N.J. W2EOS.

HQ-110C, matching speaker. Used 4 months. Original cartons shipment, \$195.00. F. Gehrk, RD #2, Montoursville, Penna.

SERVO Amplifiers, 115V AC with tubes, while they last, \$6.50. Bill Erfurt, K8OWO.

SELL: Collins 32S-1 transmitter, with AC supply, 75S-1 revcr, like new cond, \$900. Will ship. W7UPS, 145 Pine St., Eicko, Nevada.

CHIEF 90A, UM-1 wd preamp Dow-Key relay, \$60. K3GHF, 2522 Brookdale Ave., Roslyn, Penna.

GONSET G-50 for sale, \$275; Hallcrafters 540A for sale, \$80. Will ship. W4EUN, Ronald Brecher, 5 Greencare Court, Great Neck, N.Y.

COLLINS 75A1, 32V3, in beautiful condition. Push-to-talk, new spare final, Bud adjustable lo-pass filter, balun coils in special enclosure, Collins speaker. First cash offer over \$690 takes it all. Going SSB. Want: KWM-1, K8LHR, Jack Schwab, 4124 Warwick, Kansas City 11, Mo.

FOR Sale: Viking Mobile xmt, \$65; C-E 20A, \$200; Gonset G-50, like new, \$279.50; NC-58, \$99.50; SX-24, \$5.95; Heath Seneca, \$145; Viking "500" (factory wired), \$699.50; Globe Chief 90A, \$55; Globe Scout 680A, \$85; Lyco "600", \$49.50; HQ-110, \$199.50; HQ-110C, \$209; RME 4350 with spkr, \$185; Gonset 6 meter linear, \$122.50; Elmac PMR-6A with PSR-12 (both new), \$150; DX-100, \$170. Write: Art Brown, W9INZ, Brown Electronics, Inc., 1032 Broadway, Ft. Wayne, Ind.

NC-300, perf. cond, \$2.50. Can ship in orig. crt. with instr bk; Johnson Adv. with screen grid mod., perf. cond, \$35, with instr bk; Meissner Model EX signal shifter in exc. cond, \$20; instr bk; HB 100 KW xmt in 1 ft. 6 in. Bud cabinet, 304TL in final 2, 304TH in mod. 2, 872As in pwr supp., mod. exciter has speech limiting and clipping, all in exc. cond with complete set of spare tubes, has 7 meters and RF amp, mtr, \$325. Superb 1 ship KW rig. It weighs 80 lbs. Ed Berrier, KARKT, 10539 Rutters Rd., Jacksonville 8, Fla. Tel. PO 4-1760.

MOBILE Babcock D-Xmitter Model MT-5A. First \$65.00, K4OXZ.

FREE Shipment to first money-order. Soss 7202 transformer, \$20; pair 8296, \$7.50; 65B factory wired Scout, \$65.00; D-104 mike, \$10.00. Krauss, W8 SPR, 906 Morris, Sa'em, Ohio.

SELL: AR060T, Standard coils plus BC band and Hy-Gain 10 M, and 15 M, coils, NBFM adaptor, xtal, Calibrator, 60S-2 comb. speaker and coil storage rack. Rec. amateur net, \$860; gnd as new, \$475. Hammarlund C-10 excellent SSB adaptor, perf. cond, \$99. W9ADN, Box 117, Lockport, Ill.

SELL: DX-100 with grid block keying; SX-100; both in like new cond, \$325.00; need college money. Will ship but prefer local deal. K5LUU, Box 213, Tule, Okla.

FOR Sale: Collins 32V3 transmitter, in perfect condition, \$425.00. W9PTN Richard Roos, 141-48 78th Road, Flushing 67, L.I., N.Y.

2 Meter, E. F. Johnson VFO, built from a kit but never used, \$15.00 postpaid. Globe King 400B xmt: Mostly 40-20-15-10 vertical antenna; Hallcrafters HT-18 VFO, \$275. W3RMJ, F.o.b. Manheim, Penna. 77 So. Main.

SELL: Need college money: Excellent HQ-110, clock, spkr, \$200. WRL 15 meter 3-el. beam, \$27.50; 70 feet RG5U coax, \$5.00; beam and coax used 5 months. Dow-Key coax 110 v. relay, \$9. QST, building cost \$75.00, will sell for \$40.00. All replies will be answered. George Scott, K4LEX, 1709 7th Ave., Bessemer, Ala.

SELL: SX-99 revcr, Globe Chief 90 xmt and accessories. George Skvor, K8LYQ, 1406 J Street, S.W., Cedar Rapids, Iowa.

GPR 90 revcr, like new, with manual, xtal calibrator and spkr, cost \$495. Will sell for \$295. All inquiries answered. W6EPI.

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